

Nalloy, LLC

TEST REPORT FOR

A2D0US

Tested to The Following Standards:

FCC Part 15 Subpart E Section(s)

15.207 & 15.407
(NII 5.725 – 5.850GHz)

Report No.: 106407-37

Date of issue: February 9, 2022



Test Certificate # 803.01

This test report bears the accreditation symbol indicating that the testing performed herein meets the test and reporting requirements of ISO/IEC 17025 under the applicable scope of testing for CKC Laboratories, Inc.

We strive to create long-term, trust based relationships by providing sound, adaptive, customer first testing services. We embrace each of our customers' unique EMC challenges, not as an interruption to set processes, but rather as the reason we are in business.

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ADMINISTRATIVE INFORMATION

Test Report Information

REPORT PREPARED FOR:

Nalloy, LLC
2301 5th Avenue
Seattle, WA 98108

Representative: Naga Suryadevara
Customer Reference Number: 2D-07350222

DATE OF EQUIPMENT RECEIPT:

DATE(S) OF TESTING:

REPORT PREPARED BY:

Lisa Bevington
CKC Laboratories, Inc.
5046 Sierra Pines Drive
Mariposa, CA 95338

Project Number: 106407

December 6, 2021

December 6, 2021

December 6-10, 16, 21, & 23, 2021

January 5-7, 10-13, 17-21 & 24-28, 2022

February 2, 2022

Report Authorization

The test data contained in this report documents the observed testing parameters pertaining to and are relevant for only the equipment provided by the client, tested in the agreed upon operational mode(s) and configuration(s) as identified herein. Compliance assessment remains the client's responsibility. This report may not be used to claim product endorsement by A2LA or any government agencies. This test report has been authorized for release under quality control from CKC Laboratories, Inc.

A handwritten signature in black ink that reads "Steve Behm".

Steve Behm
Director of Quality Assurance & Engineering Services
CKC Laboratories, Inc.

Test Facility Information



Our laboratories are configured to effectively test a wide variety of product types. CKC utilizes first class test equipment, anechoic chambers, data acquisition and information services to create accurate, repeatable and affordable test results.

TEST LOCATION(S):
CKC Laboratories, Inc.
Canyon Park
22116 23rd Drive S.E., Suite A
Bothell, WA 98021

Software Versions

CKC Laboratories Proprietary Software	Version
EMITest Emissions	5.03.20

Site Registration & Accreditation Information

Location	*NIST CB #	FCC	Canada	Japan
Canyon Park, Bothell, WA	US0103	US1024	3082C	A-0136
Brea, CA	US0103	US1024	3082D	A-0136
Fremont, CA	US0103	US1024	3082B	A-0136
Mariposa, CA	US0103	US1024	3082A	A-0136

*CKC's list of NIST designated countries can be found at: <https://standards.gov/cabs/designations.html>

SUMMARY OF RESULTS

Standard / Specification: FCC Part 15 Subpart E - 15.407 (NII)

Test Procedure	Description	Modifications	Results
15.407(a)	Output Power	NA	PASS
15.407(a)	Power Spectral Density	NA	PASS
15.407(b)	Radiated Emissions & Band Edge	NA	PASS
15.407(e)	Occupied Bandwidth	NA	PASS
15.407(g)	Frequency Stability	NA	NP1
15.207	AC Conducted Emissions	NA	PASS

NA = Not Applicable

NP1 = CKC was not contracted to perform the required testing.

ISO/IEC 17025 Decision Rule

The declaration of pass or fail herein is based upon assessment to the specification(s) listed above, including where applicable, assessment of measurement uncertainties. For performance related tests, equipment was monitored for specified criteria identified in that section of testing.

Modifications During Testing

This list is a summary of the modifications made to the equipment during testing.

Summary of Conditions

No modifications were made during testing.

Modifications listed above must be incorporated into all production units.

Conditions During Testing

This list is a summary of the conditions noted to the equipment during testing.

Summary of Conditions

The Test Setup Photos are incorporated by reference 106407-37_Test Setup_Photos.

EQUIPMENT UNDER TEST (EUT)

During testing numerous configurations may have been utilized. The configurations listed below support compliance to the standard(s) listed in the Summary of Results section.

Configuration 1

Equipment Tested:

Device	Manufacturer	Model #	S/N
None	Nalloy, LLC	A2D0US	G3A1VF021386000B

Support Equipment:

Device	Manufacturer	Model #	S/N
Headphones	Poly	C5220T	NA
Laptop	HP	14-fq0032od	5CD12654D3
None	Nalloy, LLC	Gala	XXX
None	Nalloy, LLC	Gala	XXX
USB to Ethernet Adapter	Amazon	Gigabit Ethernet Adapter	0050B6E212BA
AC Adapter	Delta Electronics, Inc.	MDS-030AAC15	NA

Configuration 2

Equipment Tested:

Device	Manufacturer	Model #	S/N
None	Nalloy, LLC	A2D0US	G3A1VF021386000G

Support Equipment:

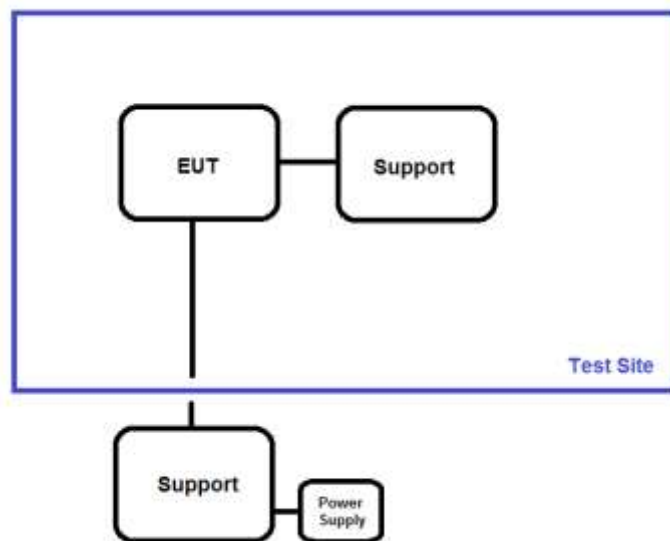
Device	Manufacturer	Model #	S/N
Headphones	Sony	WH-1000X M3	NA
Laptop	ASUS	E210M	M9N0CX21R750387
None	Nalloy, LLC	Gala	XXX
None	Nalloy, LLC	Gala	XXX
USB to Ethernet Adapter	Amazon	Gigabit Ethernet Adapter	0050B6E212BA
AC Adapter	Delta Electronics, Inc.	MDS-030AAC15	NA

General Product Information:

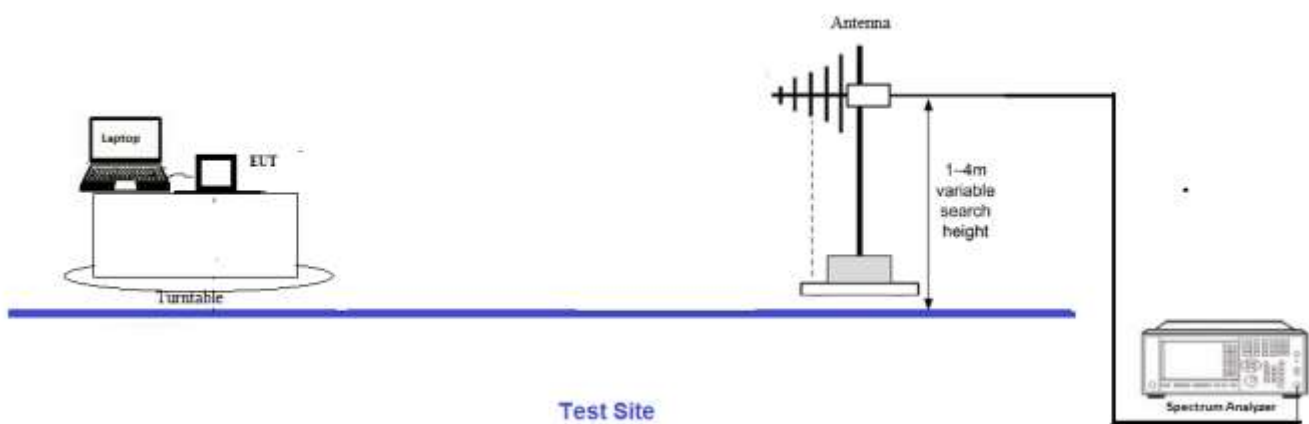
Product Information	Manufacturer-Provided Details
Equipment Type:	Stand-Alone Equipment
Type of Wideband System:	802.11a, 802.11ac (20, 40 and 80 MHz), 802.11n (20 and 40MHz BW)
Operating Frequency Range:	5745-5825 MHz
Modulation Type(s):	BPSK, QPSK, 16-QAM, 64-QAM, 256-QAM
Maximum Duty Cycle:	100% Modulated (tested worst-case)
Number of TX Chains:	1
Antenna Type(s) and Gain:	Omnidirectional / 3.8dBi
Beamforming Type:	N/A
Antenna Connection Type:	Integral (External connector provided to facilitate testing)
Nominal Input Voltage:	120VAC
Firmware / Software used for Test:	mainline-1.0.2137.0 Bin file- Golden 082621 Qualcomm radio control toolkit v4.0
The validity of results is dependent on the stated product details, the accuracy of which the manufacturer assumes full responsibility.	

Block Diagram of Test Setup(s)

Test Setup Block Diagram



Radiated test setup



Rev C

FCC Part 15 Subpart E

15.407(a) Output Power

Test Setup/Conditions – RF Conducted Measurement			
Test Location:	Bothell Lab C3	Test Engineer:	M. Harrison
Test Method:	ANSI C63.10 (2013), KDB 789033	Test Date(s):	1/26/2022
Configuration:	1		
Test Setup:	Duty Cycle: 100% (Test Mode) Test Mode: Continuously transmitting Test Setup: EUT is transmitting through the antenna port connector and is attached to the spectrum analyzer.		

Test Equipment					
Asset#	Description	Manufacturer	Model	Cal Date	Cal Due
02872	Spectrum Analyzer	Agilent	E4440A	11/29/2021	11/29/2023
P06011	Cable	Andrew	Helix	8/7/2020	8/7/2022
03514	Multimeter	Fluke	87	12/3/2020	12/3/2022
01505B	AC Power Supply	PPS	345AMXT-UPC32	6/15/2021	6/15/2023

Test Data Summary - Voltage Variations					
Frequency (MHz)	Modulation / Ant Port	V _{Minimum} (dBm)	V _{Nominal} (dBm)	V _{Maximum} (dBm)	Max Deviation from V _{Nominal} (dB)
5825	802.11a	18.7	18.8	18.8	0.1
5825	802.11n20	19.2	19.2	19.2	0.0
5795	802.11n40	19.5	19.5	19.5	0.0
5825	802.11ac20	19.2	19.3	19.3	0.1
5795	802.11ac40	19.6	19.6	19.6	0.0
5775	802.11ac80	18.3	18.3	18.3	0.0

Test performed using operational mode with the highest output power, representing worst case.

Parameter Definitions:

Measurements performed at input voltage V_{Nominal} ± 15%.

Parameter	Value
V _{Nominal} :	120
V _{Minimum} :	102
V _{Maximum} :	138

Test Data Summary - RF Conducted Measurement					
Measurement Option: AVGSA-1					
Frequency (MHz)	Modulation	Ant. Type / Gain (dBi)	Measured (dBm)	Limit (dBm)	Results
5745	802.11a	Omnidirectional / 3.8dBi	17.8	≤30	Pass
5785	802.11a	Omnidirectional / 3.8dBi	18.4	≤30	Pass
5825	802.11a	Omnidirectional / 3.8dBi	18.8	≤30	Pass
5745	802.11n20	Omnidirectional / 3.8dBi	17.8	≤30	Pass
5785	802.11n20	Omnidirectional / 3.8dBi	18.4	≤30	Pass
5825	802.11n20	Omnidirectional / 3.8dBi	19.2	≤30	Pass
5755	802.11n40	Omnidirectional / 3.8dBi	19.0	≤30	Pass
5795	802.11n40	Omnidirectional / 3.8dBi	19.5	≤30	Pass
5745	802.11ac20	Omnidirectional / 3.8dBi	17.8	≤30	Pass
5785	802.11ac20	Omnidirectional / 3.8dBi	17.8	≤30	Pass
5825	802.11ac20	Omnidirectional / 3.8dBi	19.3	≤30	Pass
5755	802.11ac40	Omnidirectional / 3.8dBi	18.5	≤30	Pass
5795	802.11ac40	Omnidirectional / 3.8dBi	19.6	≤30	Pass
5775	802.11ac80	Omnidirectional / 3.8dBi	18.3	≤30	Pass

For equipment using antennas other than in fixed point-to-point applications, the limit is calculated in accordance with 15.407(a)(3):

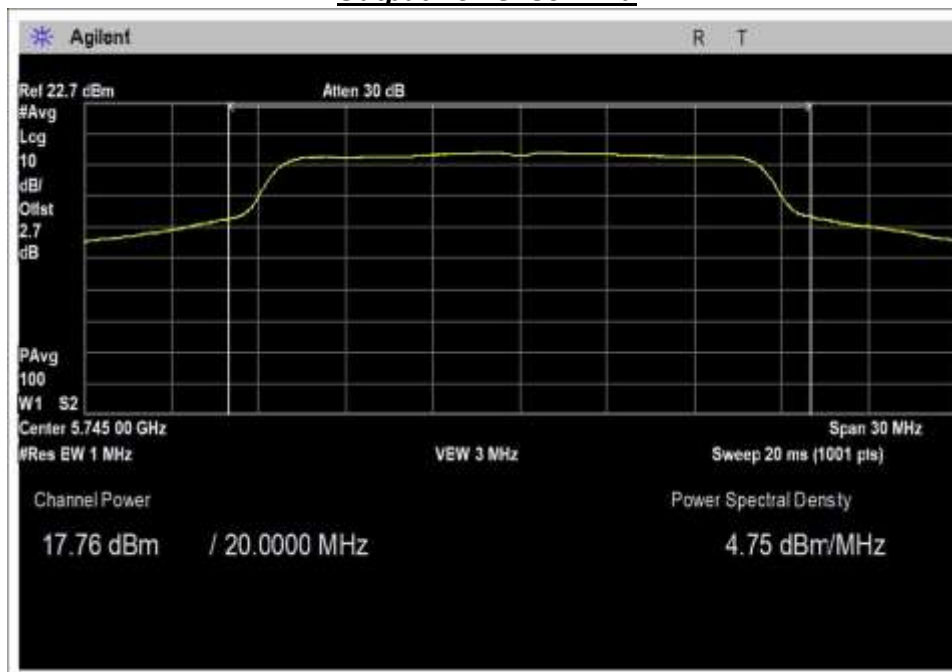
$$\text{Limit} = 30 - \text{Roundup}(G - 6)$$

For equipment using antennas in fixed point-to-point applications, the limit is calculated in accordance with 15.407(a)(3):

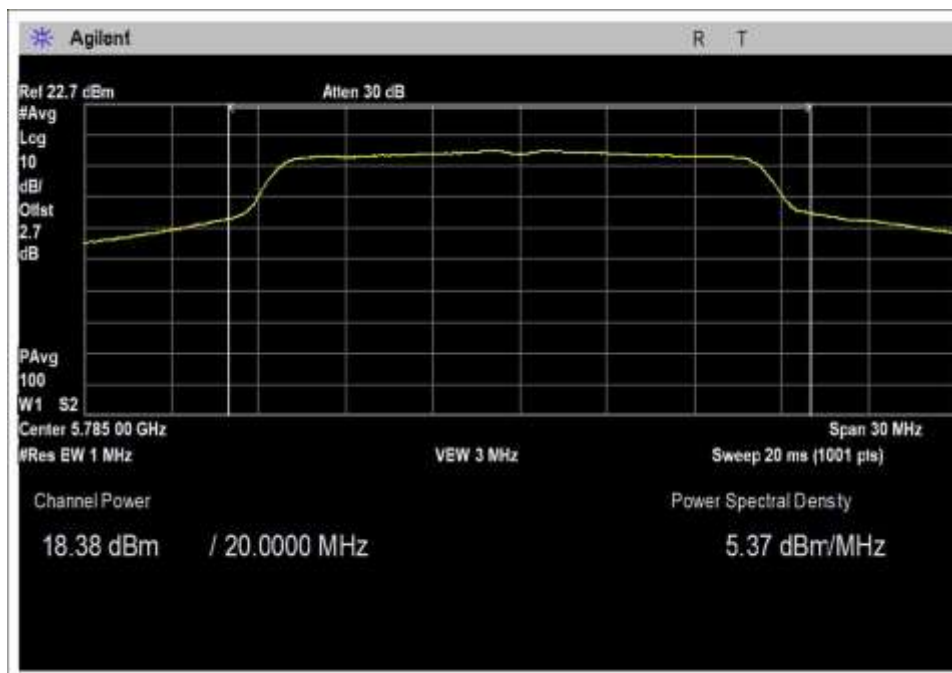
$$\text{Limit} = 30$$

Plot Data – RF Conducted Measurement

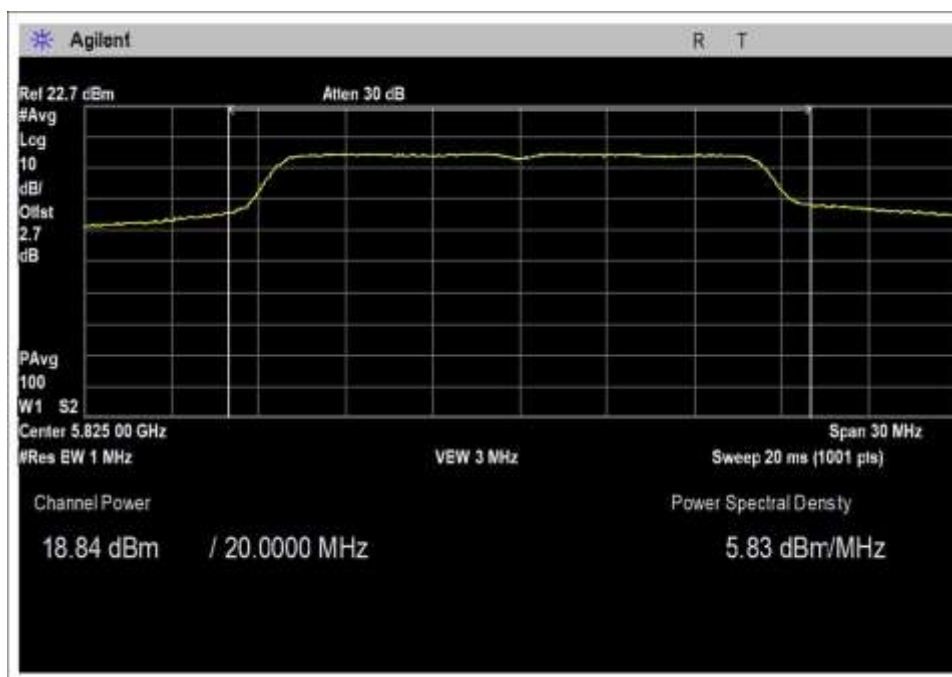
Output Power 802.11a



Low Channel

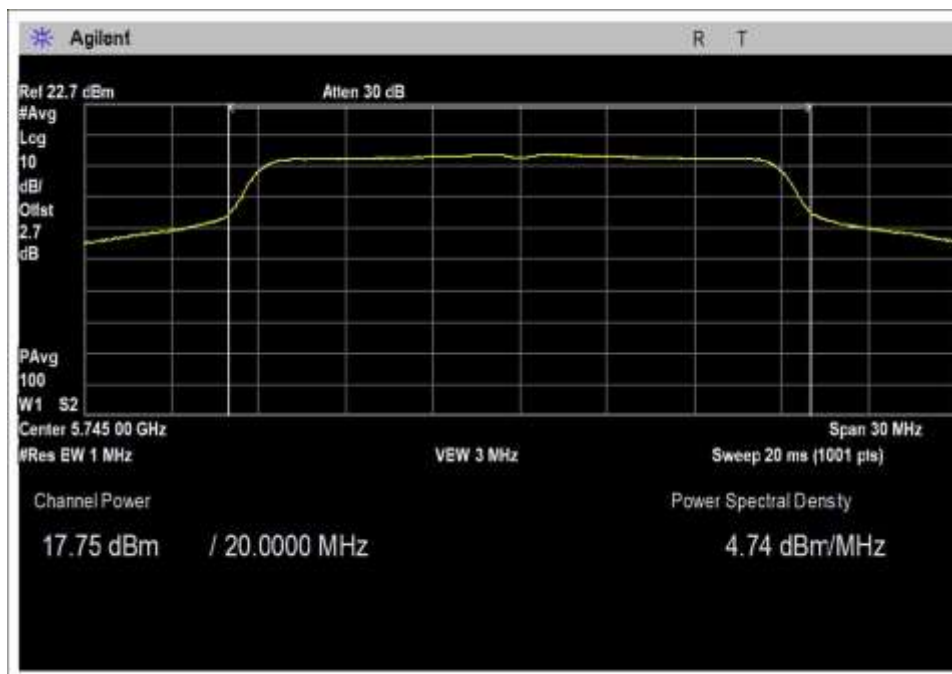


Middle Channel

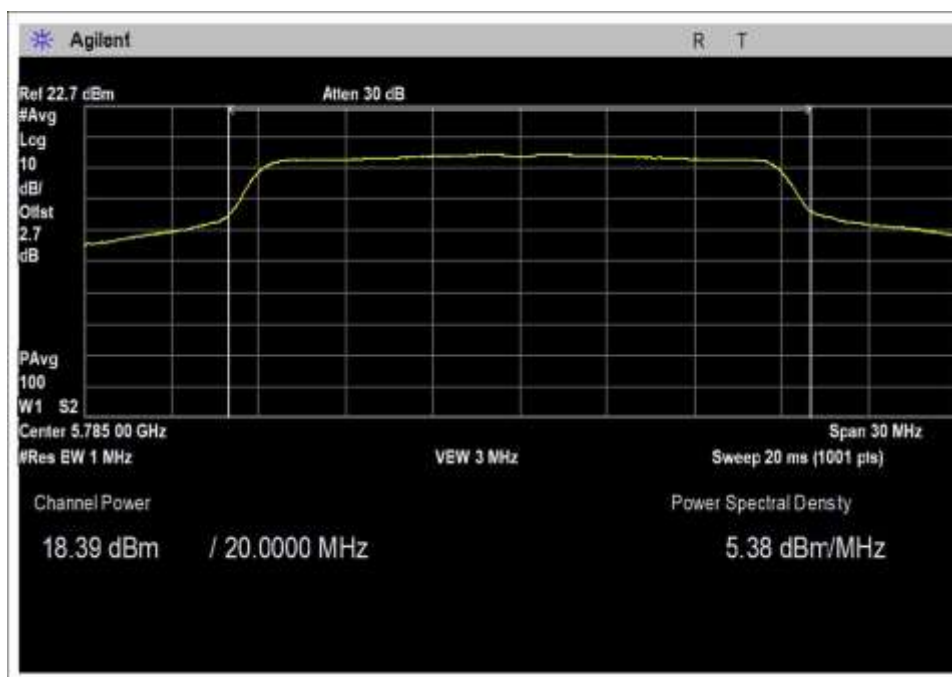


High Channel

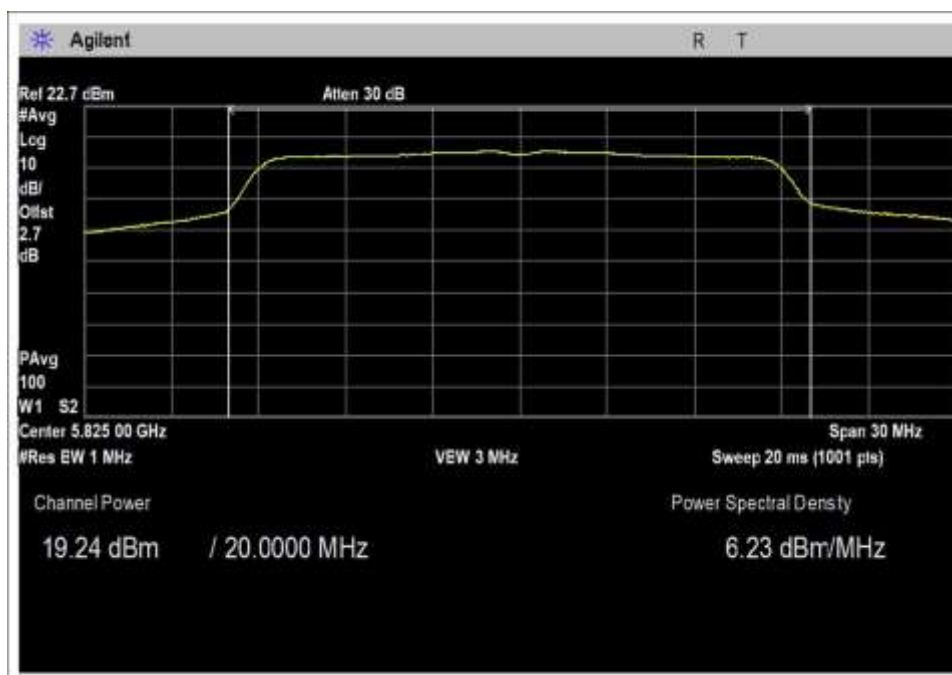
Output Power 802.11n20



Low Channel

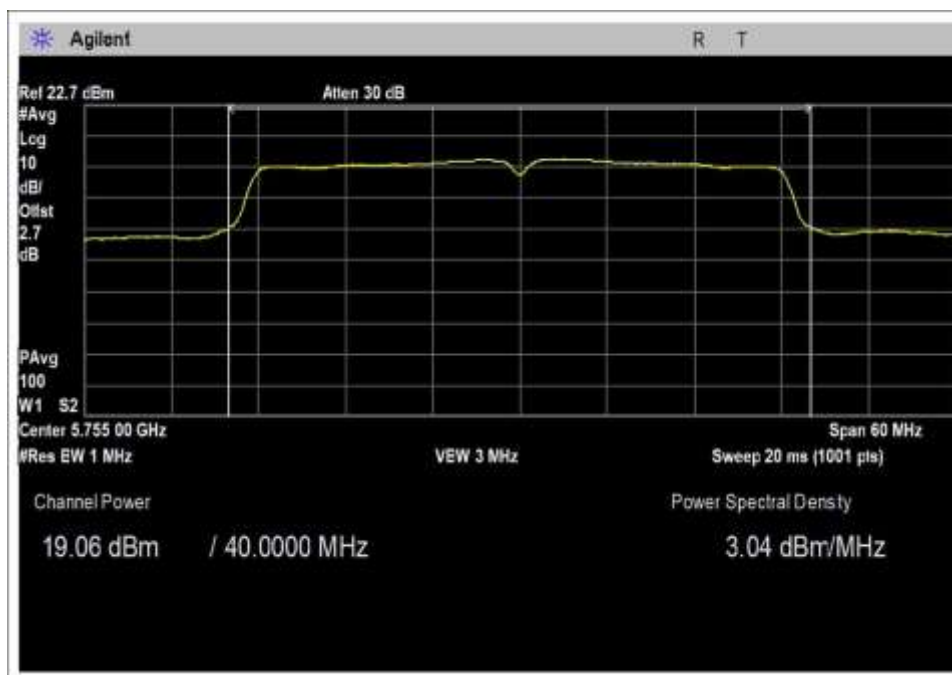


Middle Channel

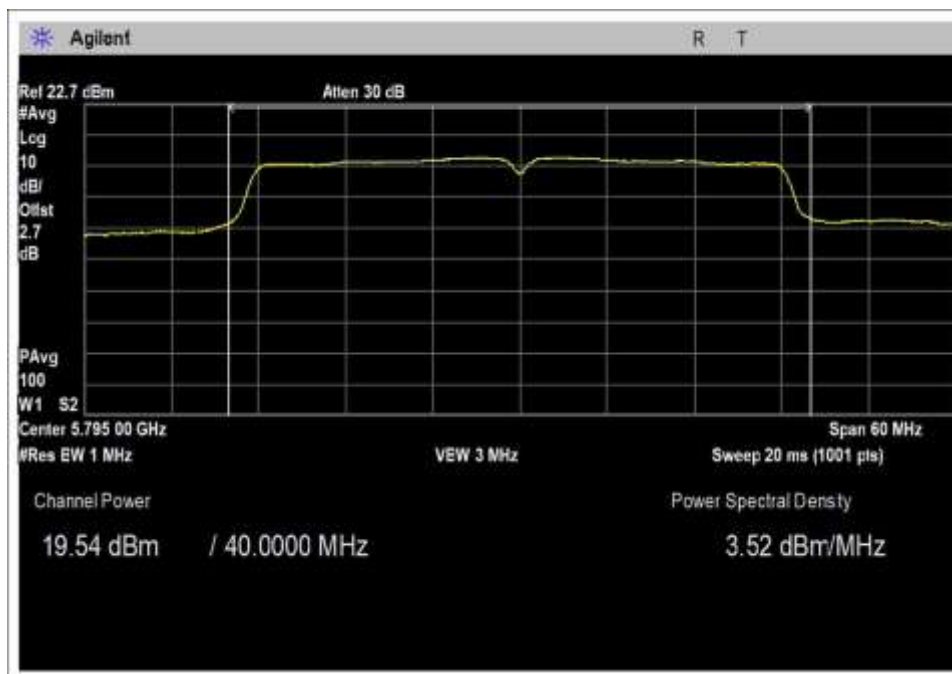


High Channel

Output Power 802.11n40

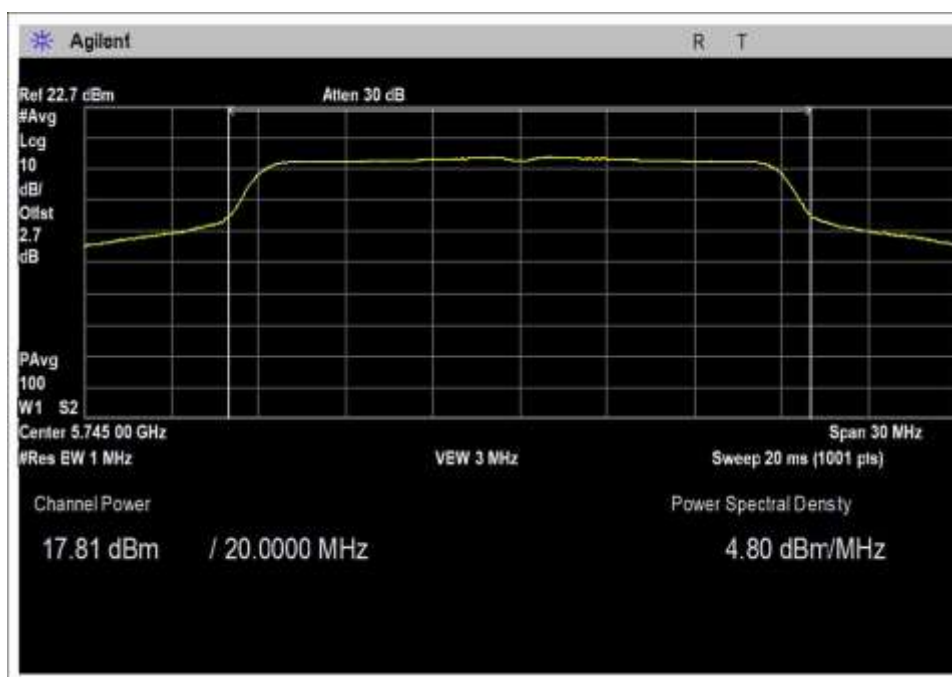


Low Channel

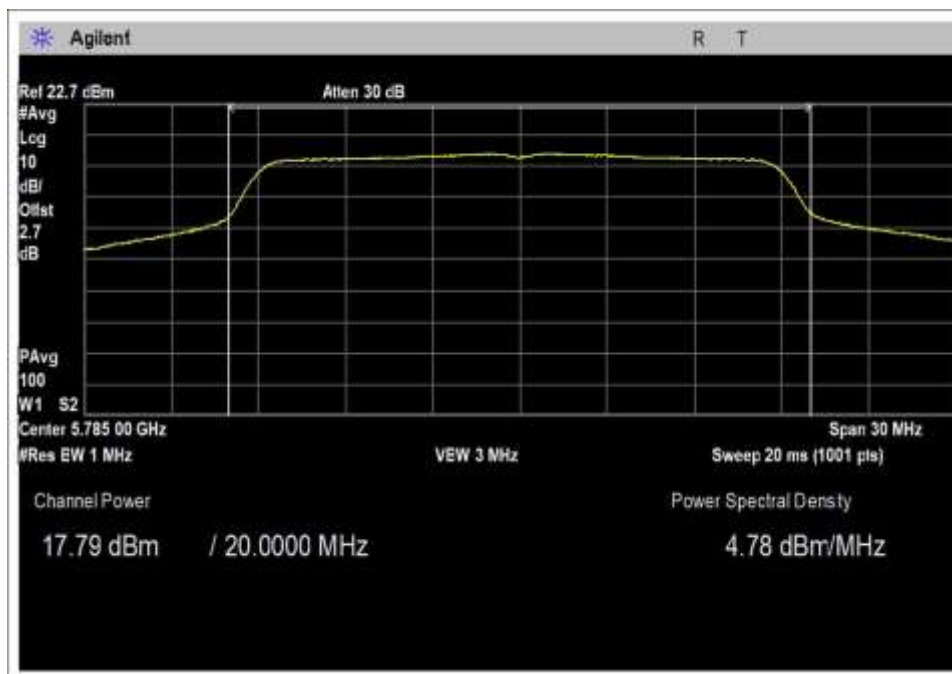


High Channel

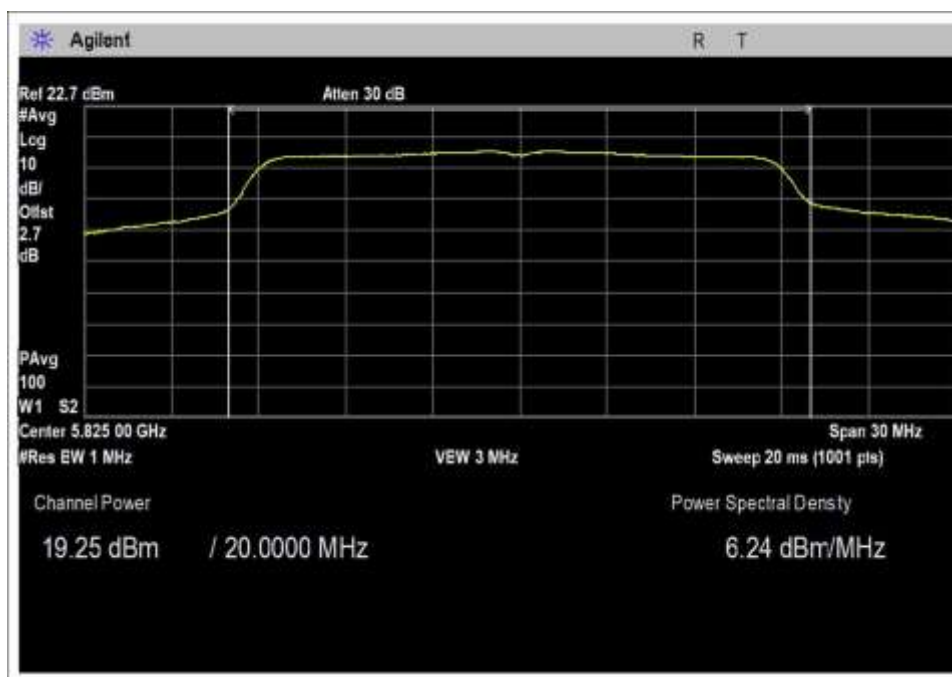
Output Power 802.11ac20



Low Channel

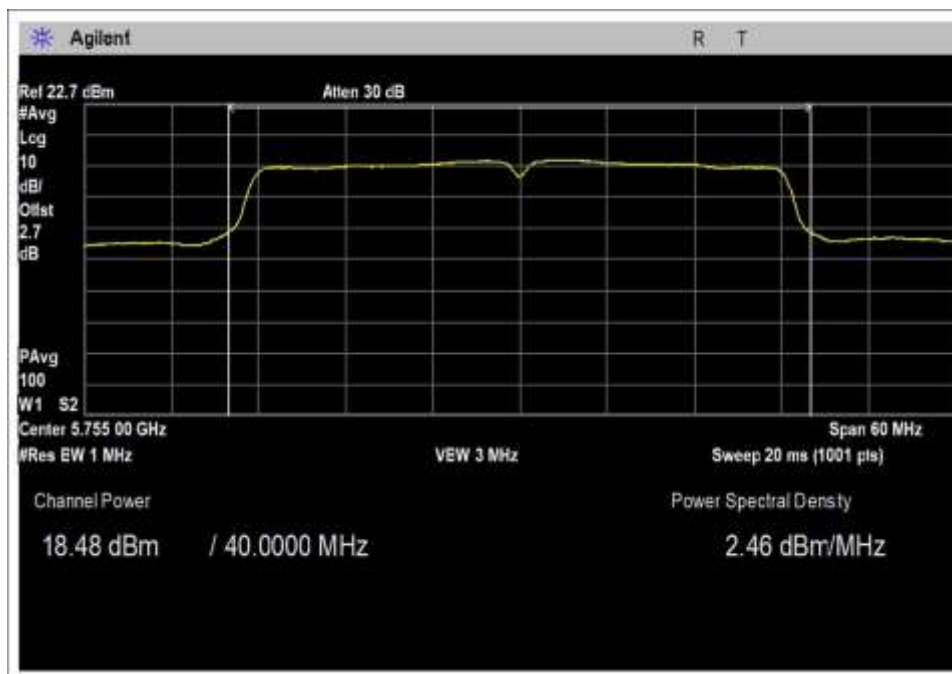


Middle Channel

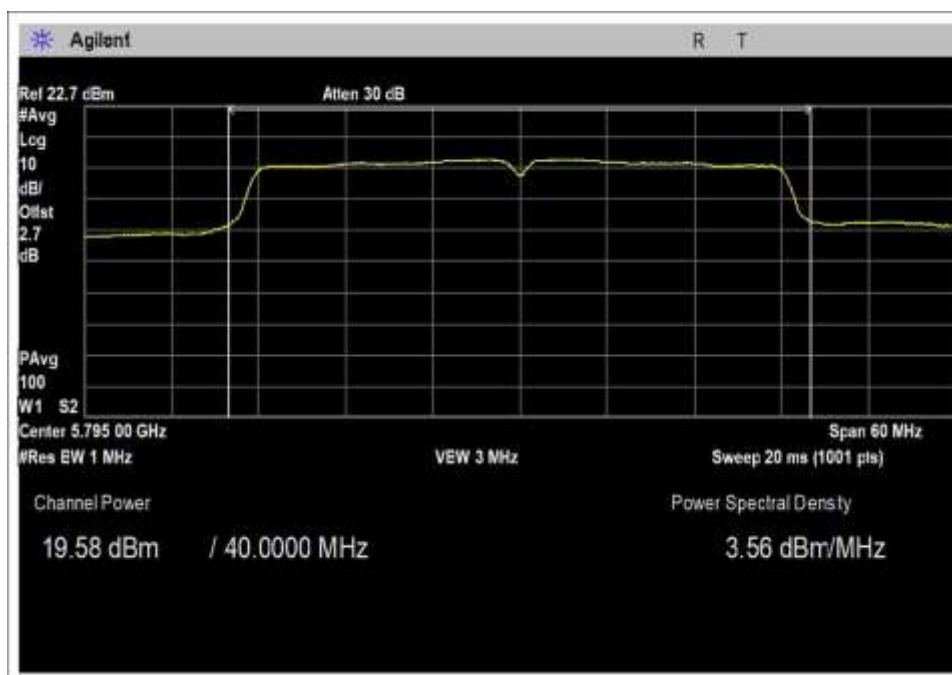


High Channel

Output Power 802.11ac40



Low Channel



High Channel

Output Power 802.11ac80



15.407(a) Power Spectral Density

Test Setup/Conditions - RF Conducted Measurement			
Test Location:	Bothell Lab C3	Test Engineer:	M. Harrison
Test Method:	ANSI C63.10 (2013), KDB 789033	Test Date(s):	1/27/2022
Configuration:	1		
Test Setup:	Duty Cycle: 100% (Test Mode) Test Mode: Continuously transmitting Test Setup: EUT is transmitting through the antenna port connector and is attached to the spectrum analyzer.		

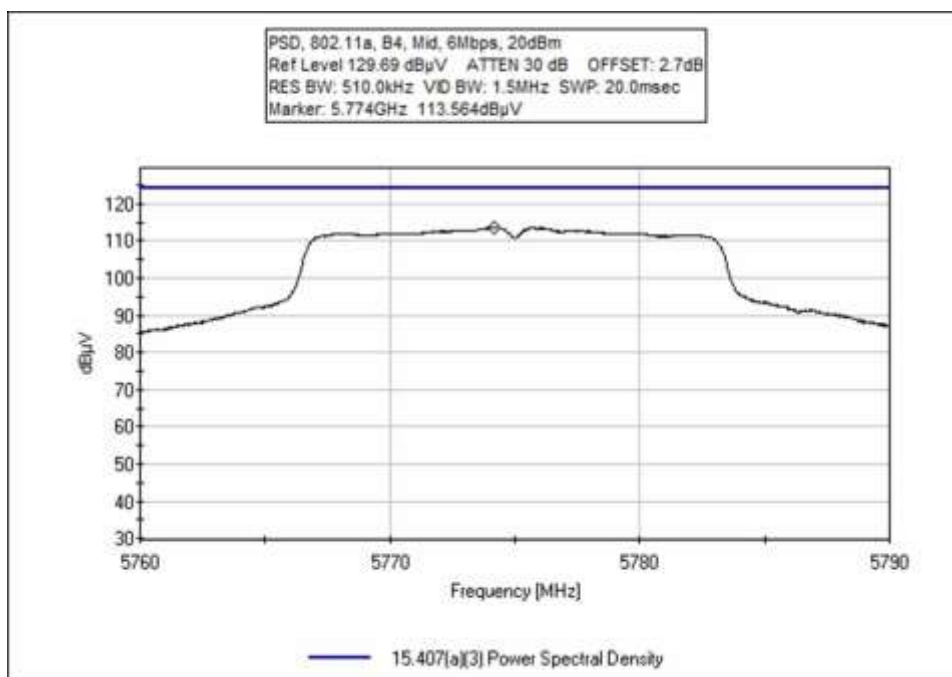
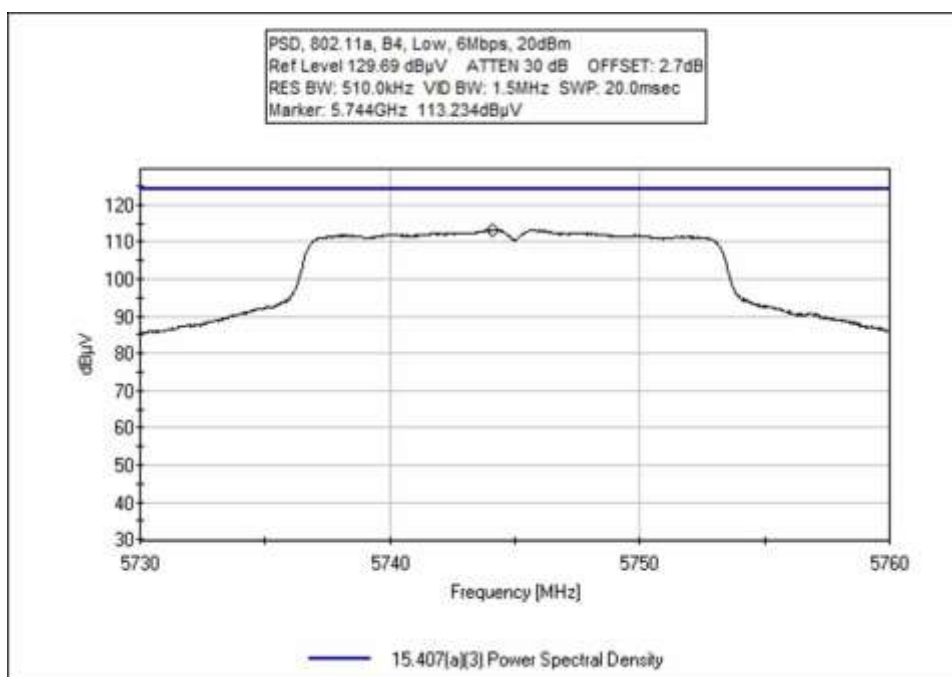
Environmental Conditions			
Temperature (°C)	21	Relative Humidity (%):	45

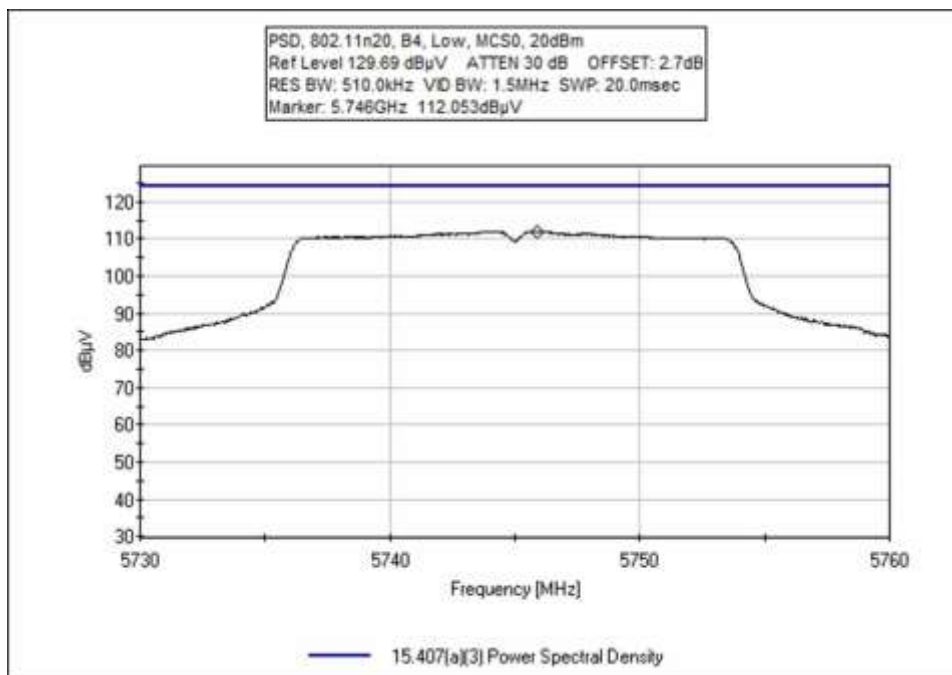
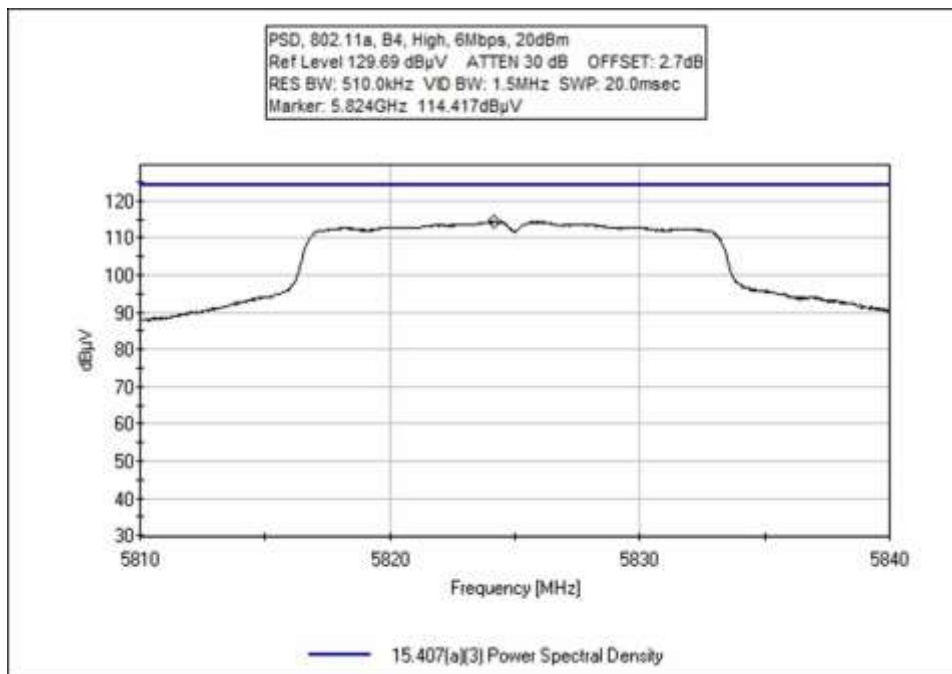
Test Data Summary - RF Conducted Measurement					
Measurement Option: AVGSA-1					
Frequency (MHz)	Modulation	Ant. Type / Gain (dBi)	Measured (dBm/500kHz)	Limit (dBm/500kHz)	Results
5745	802.11a	Omnidirectional / 3.8dBi	6.2	≤ 30	Pass
5785	802.11a	Omnidirectional / 3.8dBi	6.6	≤ 30	Pass
5825	802.11a	Omnidirectional / 3.8dBi	7.4	≤ 30	Pass
5745	802.11n20	Omnidirectional / 3.8dBi	5.6	≤ 30	Pass
5785	802.11n20	Omnidirectional / 3.8dBi	5.9	≤ 30	Pass
5825	802.11n20	Omnidirectional / 3.8dBi	6.8	≤ 30	Pass
5755	802.11n40	Omnidirectional / 3.8dBi	3.9	≤ 30	Pass
5795	802.11n40	Omnidirectional / 3.8dBi	3.7	≤ 30	Pass
5745	802.11ac20	Omnidirectional / 3.8dBi	5.1	≤ 30	Pass
5785	802.11ac20	Omnidirectional / 3.8dBi	5.5	≤ 30	Pass
5825	802.11ac20	Omnidirectional / 3.8dBi	6.3	≤ 30	Pass
5755	802.11ac40	Omnidirectional / 3.8dBi	3.3	≤ 30	Pass
5795	802.11ac40	Omnidirectional / 3.8dBi	4.1	≤ 30	Pass
5775	802.11ac80	Omnidirectional / 3.8dBi	0.3	≤ 30	Pass

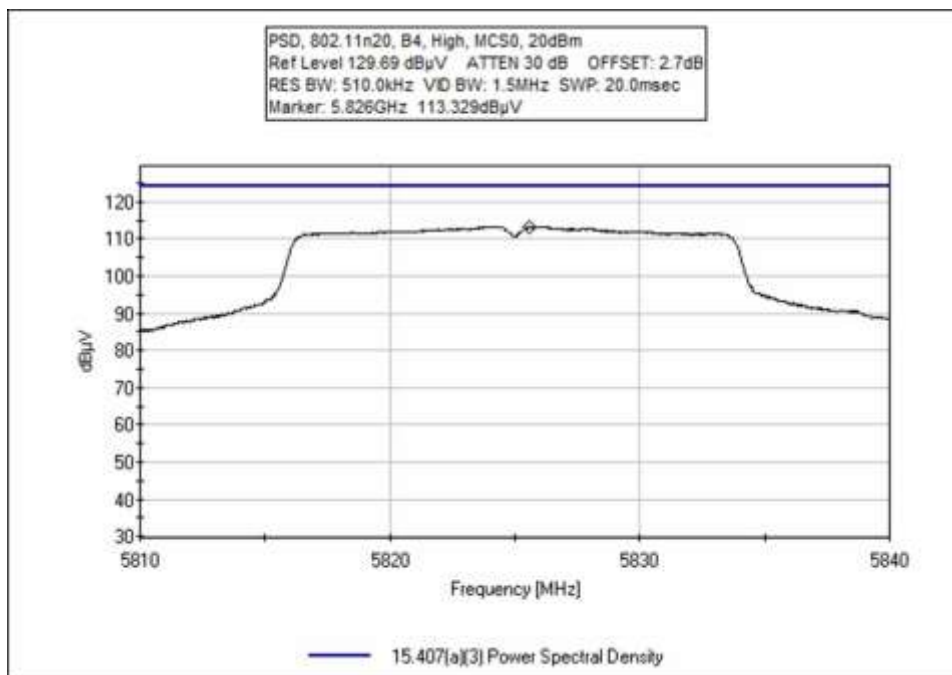
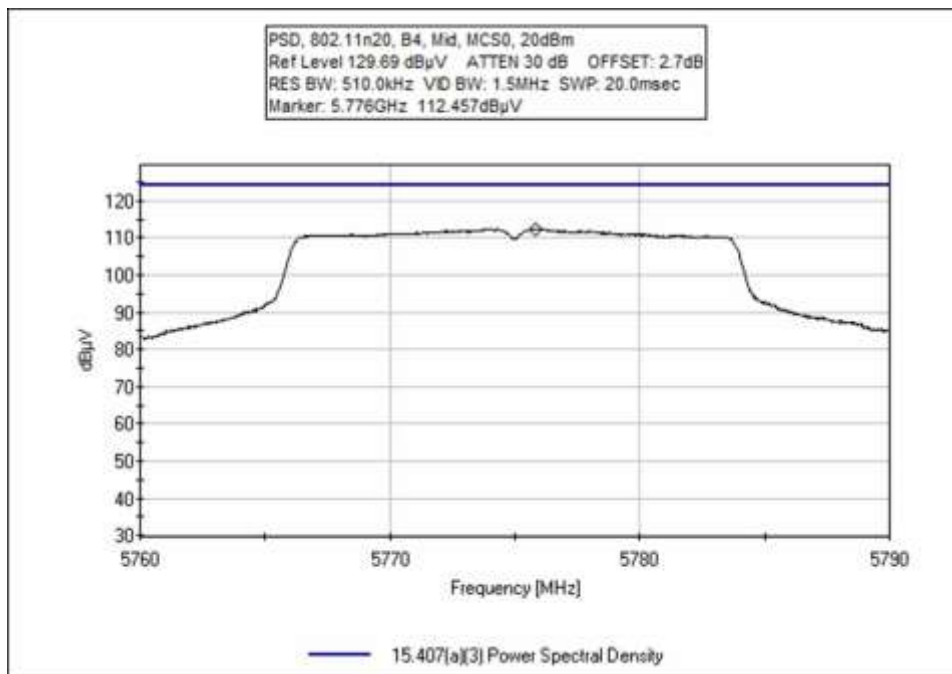
The limit is calculated in accordance with 15.407(a)(3):

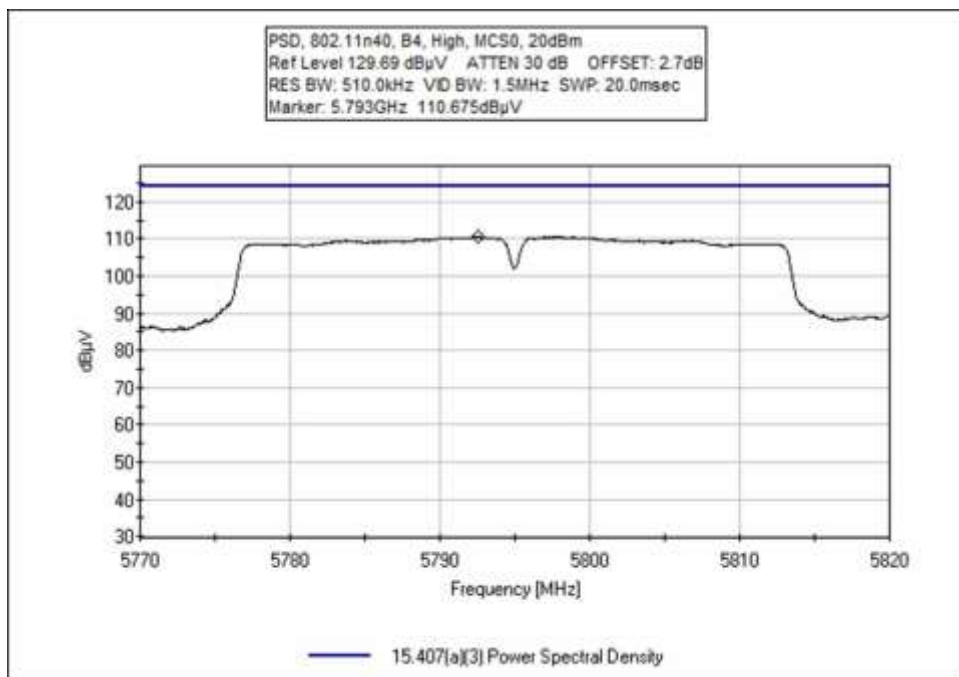
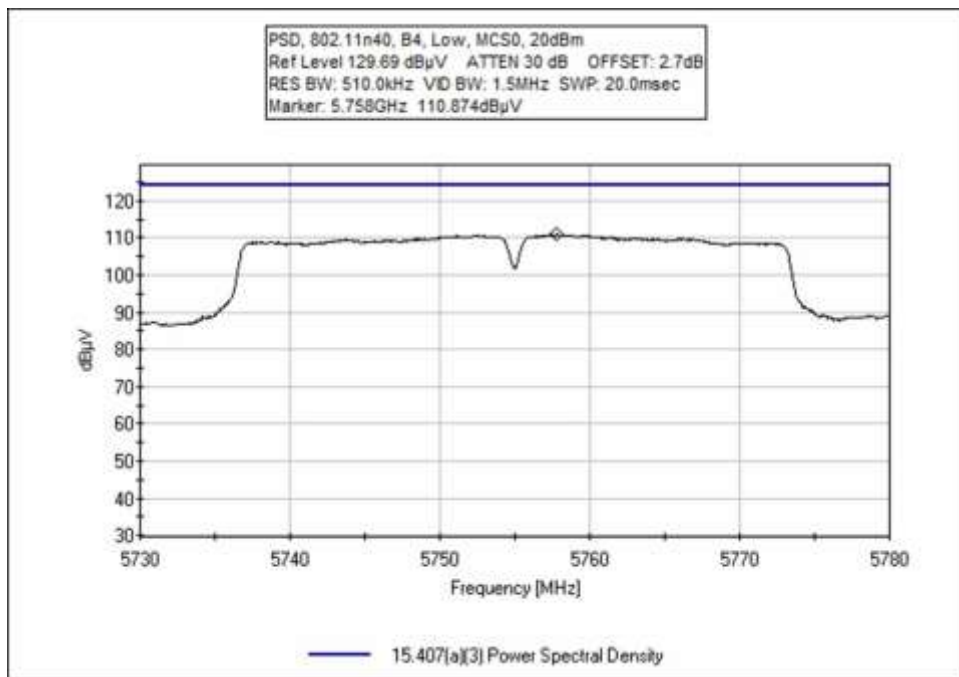
$$\text{Limit} = 30 - \text{Roundup}(G - 6)$$

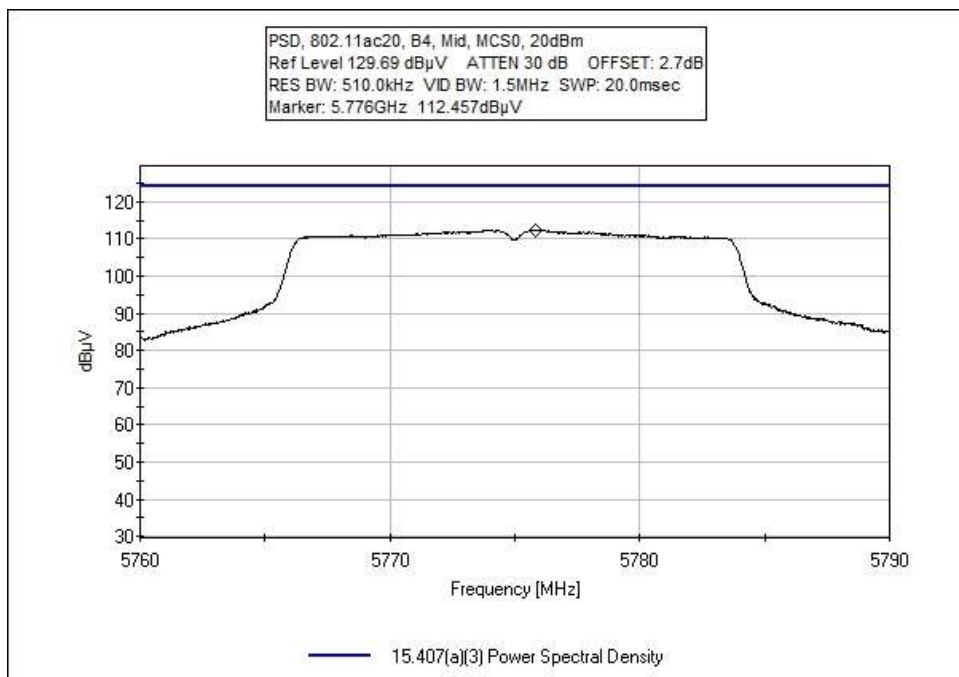
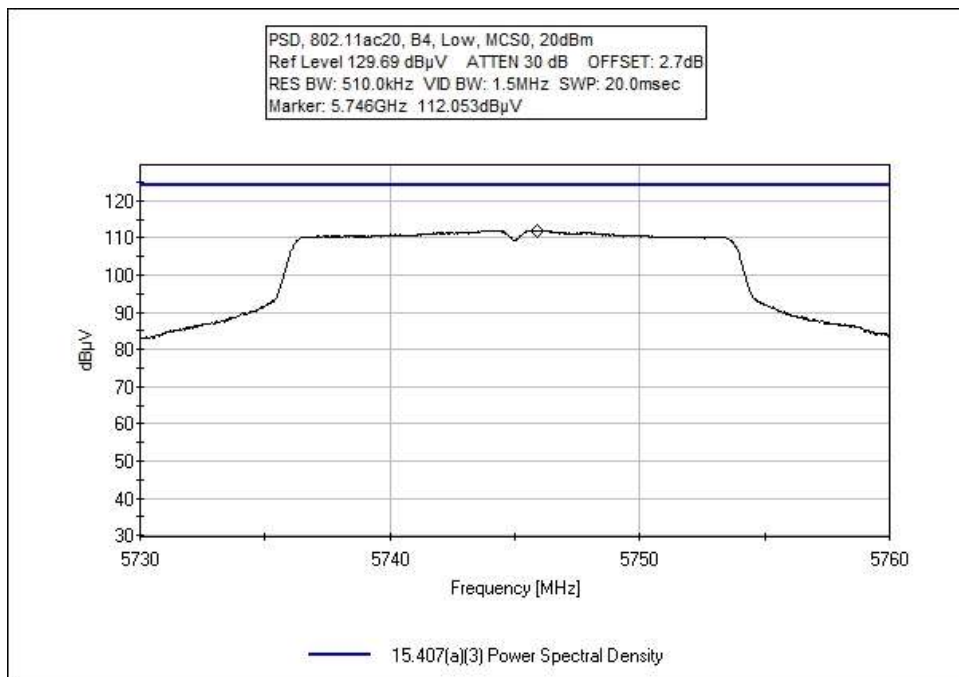
Plots

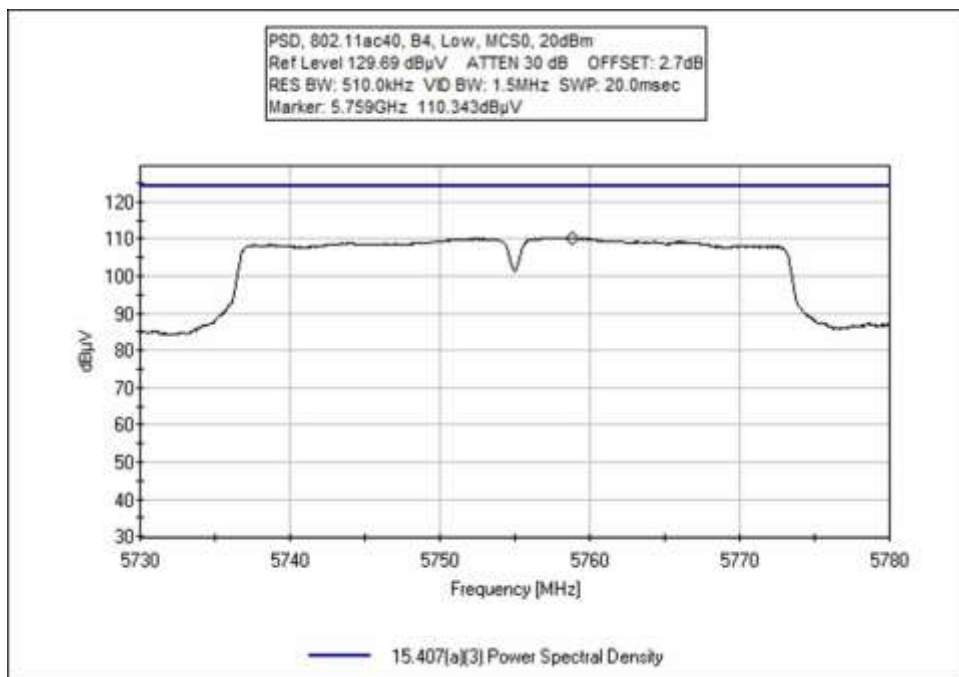
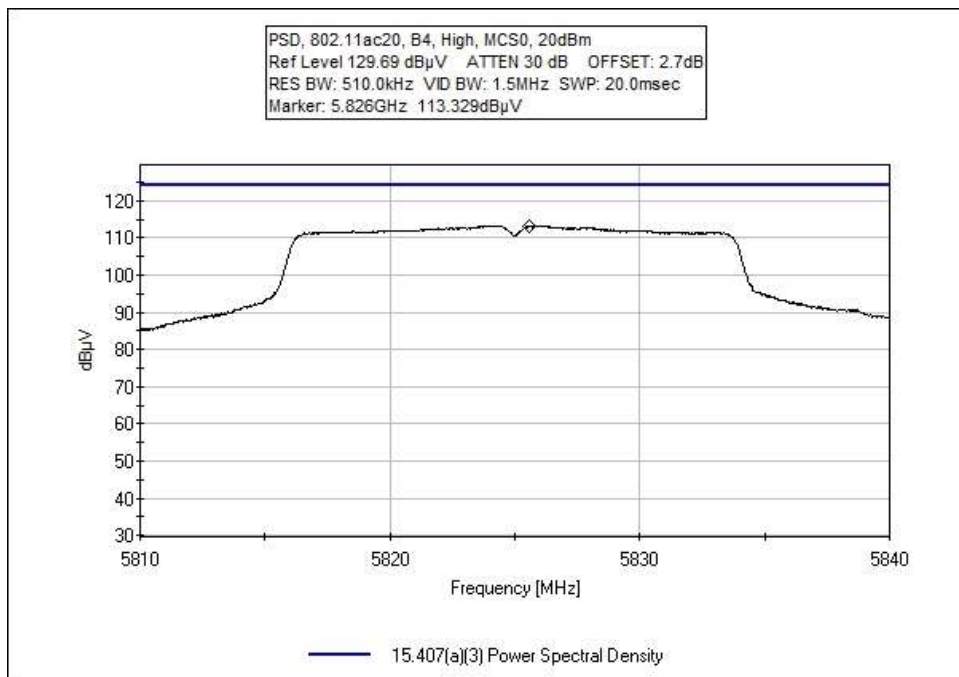


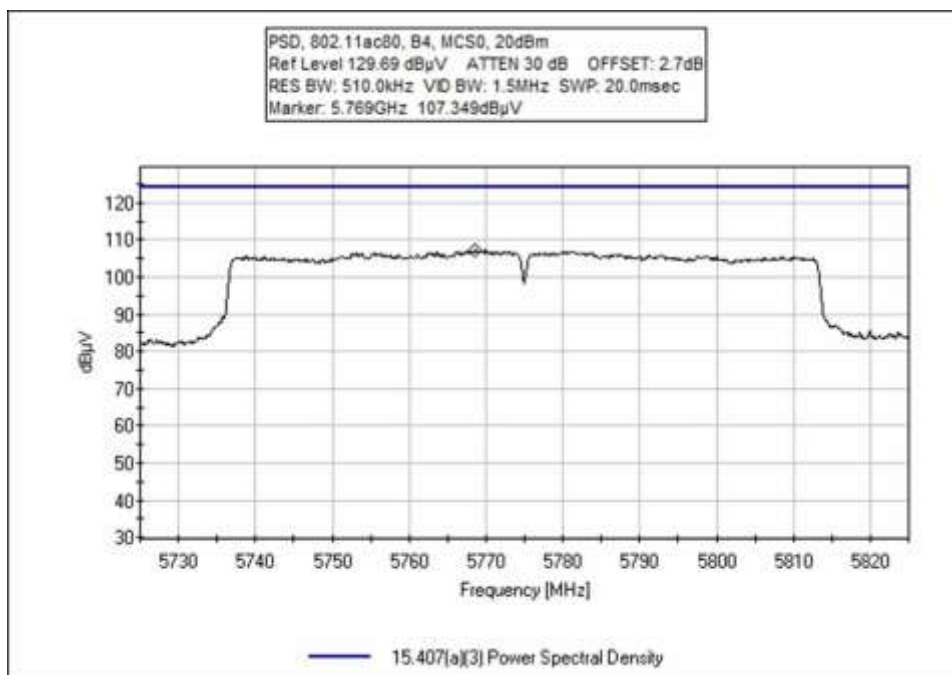
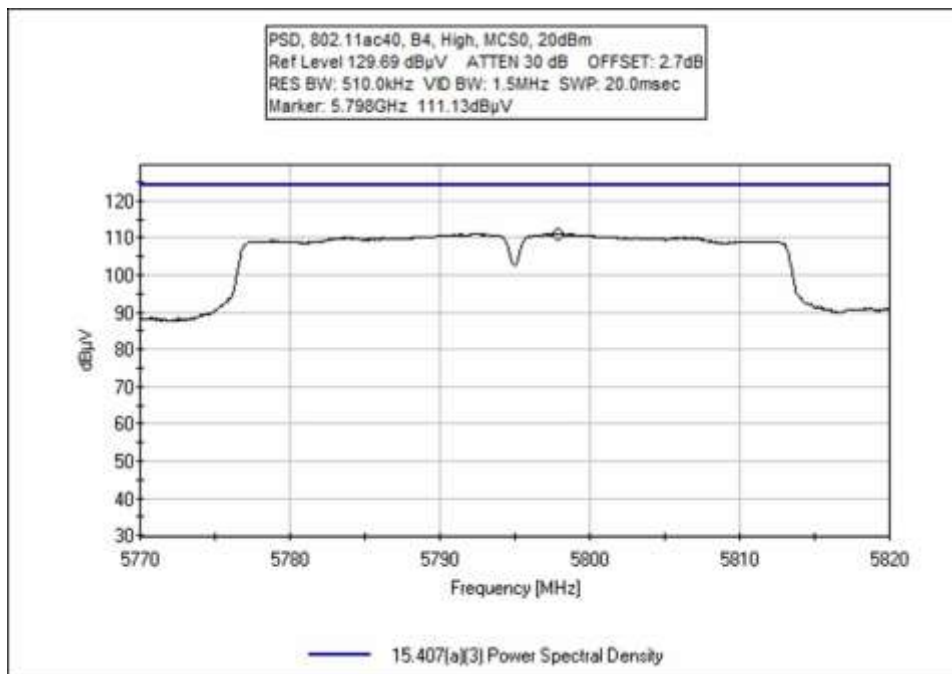












Test Data – Radiated Measurement

Test Location: CKC Laboratories, Inc. • 22116 23rd Drive SE, Suite A • Bothell, WA 98021 • 1-800-500-4EMC (4362)
 Customer: **Nalloy, LLC**
 Specification: **15.407(a)(3) Power Spectral Density**
 Work Order #: **106407** Date: 1/27/2022
 Test Type: **Conducted Emissions** Time: 14:33:57
 Tested By: M. Harrison Sequence#: 66
 Software: EMITest 5.03.20 120V 60Hz

Equipment Tested:

Device	Manufacturer	Model #	S/N
Configuration 1			

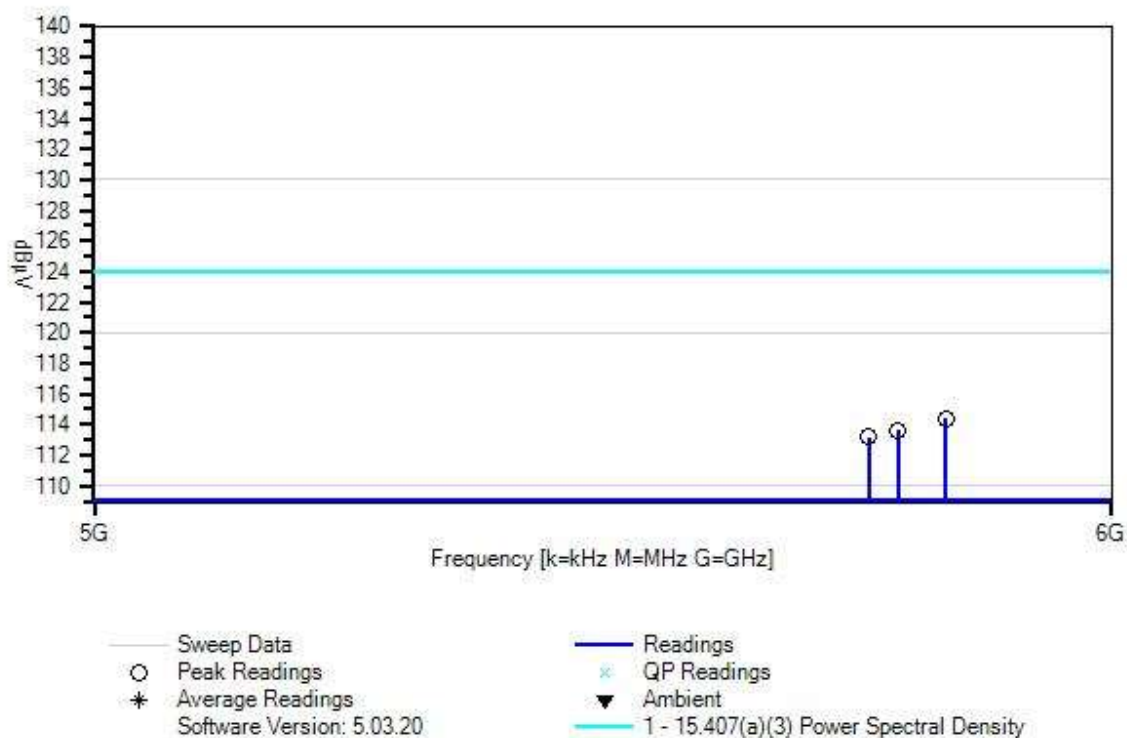
Support Equipment:

Device	Manufacturer	Model #	S/N
Configuration 1			

Test Conditions / Notes:

Environmental Conditions: Temperature: 21°C Humidity: 45% Pressure: 101.2kPa Method: ANSI C63.10: 2013 Frequency range: 5745-5825 MHz Setup: Antenna 0 Channels: 5745, 5775, 5825 MHz 802.11a Band 4 Rate: 6-54 Mbps PWR Output: 20 dBm 100% Duty Cycle Notes: PSD Measurements were performed with corresponding correction factors applied as an offset in the Spectrum Analyzer.
--

Nalloy, LLC WO#: 106121 Sequence#: 66 Date: 1/27/2022
15.407(a)(3) Power Spectral Density Test Lead: 120V 60Hz Antenna Port



Test Equipment:

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
	ANUFL Adapter	Test Data Adjustment		1/14/2022	1/14/2024
	ANP05961	Cable	Helix	6/9/2021	6/9/2023
T1	AN02872	Spectrum Analyzer	E4440A	11/29/2021	11/29/2023

Measurement Data:

Reading listed by margin.

Test Lead: Antenna Port

#	Freq MHz	Rdng dBμV	T1 dB				Dist Table	Corr dBμV	Spec dBμV	Margin dB	Polar Ant
1	5824.190M	114.4	+0.0				+0.0	114.4	124.0	-9.6	Anten
									6Mbps, 20dBm		
2	5774.160M	113.6	+0.0				+0.0	113.6	124.0	-10.4	Anten
									6Mbps, 20dBm		
3	5744.130M	113.2	+0.0				+0.0	113.2	124.0	-10.8	Anten
									6Mbps, 20dBm		



Test Location: CKC Laboratories, Inc. • 22116 23rd Drive SE, Suite A • Bothell, WA 98021 • 1-800-500-4EMC (4362)
 Customer: **Nalloy, LLC**
 Specification: **15.407(a)(3) Power Spectral Density**
 Work Order #: **106407** Date: 1/27/2022
 Test Type: **Conducted Emissions** Time: 14:30:02
 Tested By: M. Harrison Sequence#: 65
 Software: EMITest 5.03.20 120V 60Hz

Equipment Tested:

Device	Manufacturer	Model #	S/N
Configuration 1			

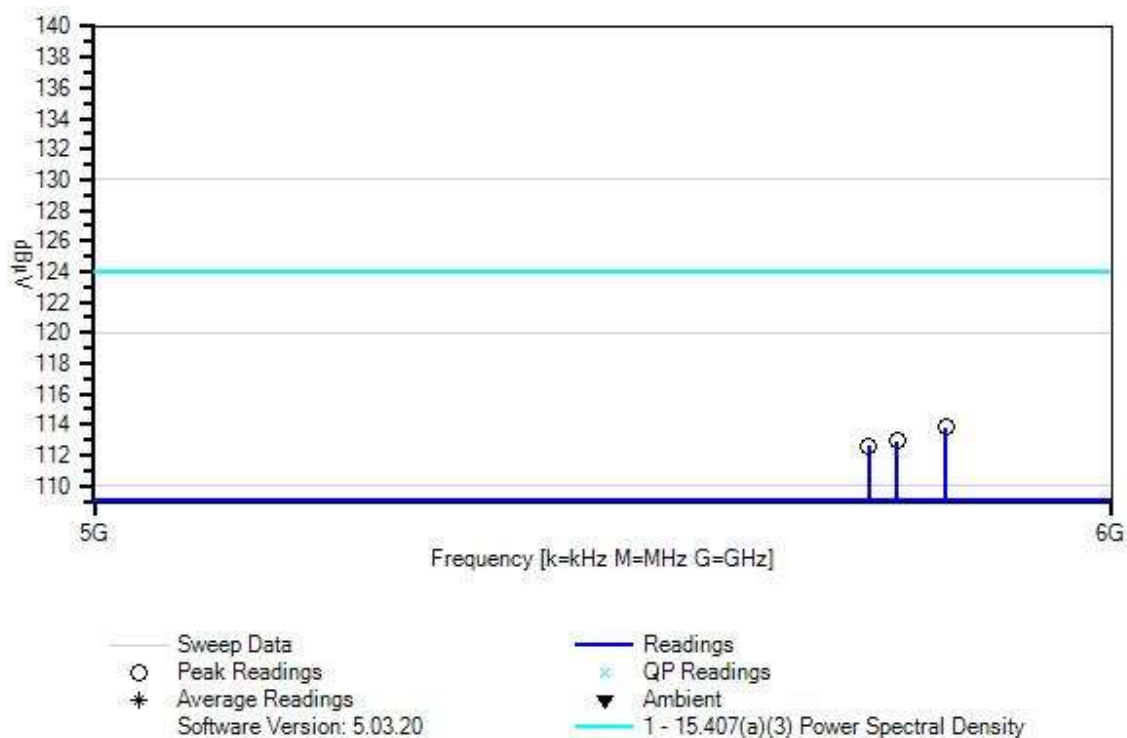
Support Equipment:

Device	Manufacturer	Model #	S/N
Configuration 1			

Test Conditions / Notes:

Environmental Conditions: Temperature: 21°C Humidity: 45% Pressure: 101.2kPa Method: ANSI C63.10: 2013 Frequency range: 5745-5825 MHz Setup: Antenna 0 Channels: 5745, 5775, 5825 MHz 802.11n20 Band 4 Rate: MCS0-7 PWR Output: 20 dBm 100% Duty Cycle Notes: PSD Measurements were performed with corresponding correction factors applied as an offset in the Spectrum Analyzer.

Nalloy, LLC WO#: 106121 Sequence#: 65 Date: 1/27/2022
15.407(a)(3) Power Spectral Density Test Lead: 120V 60Hz Antenna Port



Test Equipment:

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
	ANUFL Adapter	Test Data Adjustment		1/14/2022	1/14/2024
	ANP05961	Cable	Helix	6/9/2021	6/9/2023
T1	AN02872	Spectrum Analyzer	E4440A	11/29/2021	11/29/2023

Measurement Data:

Reading listed by margin.

Test Lead: Antenna Port

#	Freq MHz	Rdng dBμV	T1 dB				Dist Table	Corr dBμV	Spec dBμV	Margin dB	Polar Ant
1	5823.830M	113.8	+0.0				+0.0	113.8	124.0	-10.2	Anten
									MCS0, 20dBm		
2	5773.740M	112.9	+0.0				+0.0	112.9	124.0	-11.1	Anten
									MCS0, 20dBm		
3	5744.160M	112.6	+0.0				+0.0	112.6	124.0	-11.4	Anten
									MCS0, 20dBm		



Test Location: CKC Laboratories, Inc. • 22116 23rd Drive SE, Suite A • Bothell, WA 98021 • 1-800-500-4EMC (4362)
 Customer: **Nalloy, LLC**
 Specification: **15.407(a)(3) Power Spectral Density**
 Work Order #: **106407** Date: 1/27/2022
 Test Type: **Conducted Emissions** Time: 14:55:02
 Tested By: M. Harrison Sequence#: 63
 Software: EMITest 5.03.20 120V 60Hz

Equipment Tested:

Device	Manufacturer	Model #	S/N
Configuration 1			

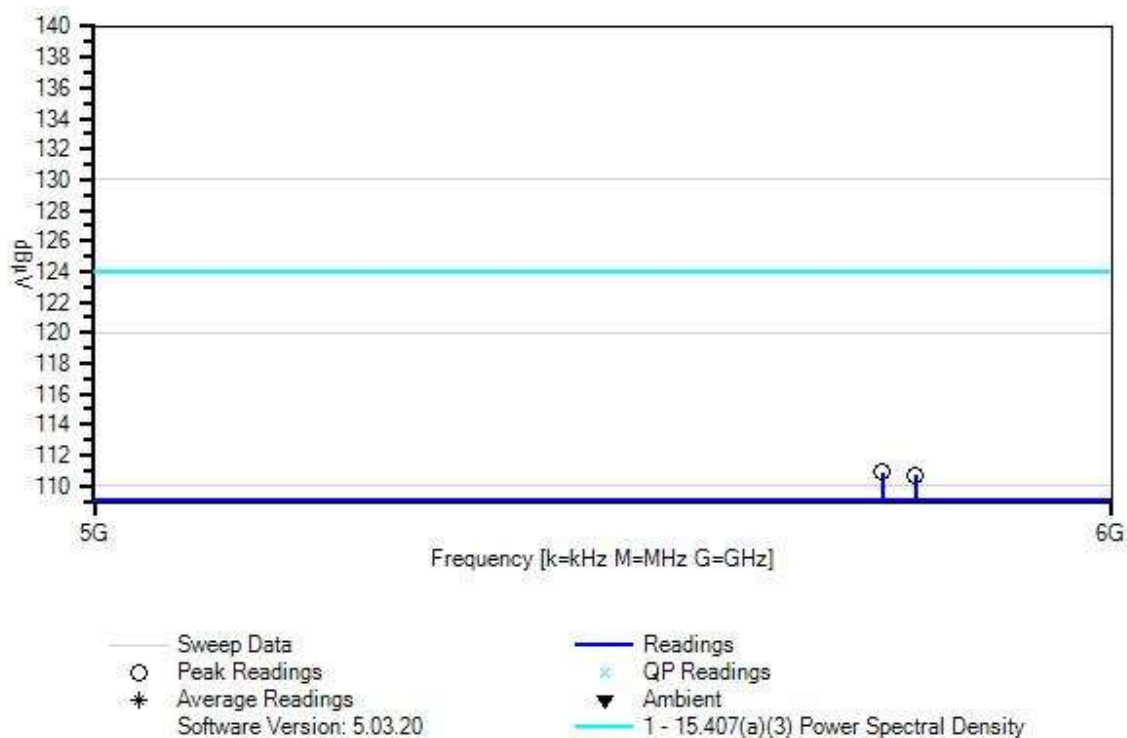
Support Equipment:

Device	Manufacturer	Model #	S/N
Configuration 1			

Test Conditions / Notes:

Environmental Conditions: Temperature: 21°C Humidity: 45% Pressure: 101.2kPa Method: ANSI C63.10: 2013 Frequency range: 5755-5795 MHz Setup: Antenna 0 Channels: 5755, 5795 MHz 802.11n40 Band 4 Rate: MCS0-7 PWR Output: Low/Mid: 20 dBm, High: 20 dBm 100% Duty Cycle Notes: PSD Measurements were performed with corresponding correction factors applied as an offset in the Spectrum Analyzer.
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Nalloy, LLC WO#: 106121 Sequence#: 63 Date: 1/27/2022
15.407(a)(3) Power Spectral Density Test Lead: 120V 60Hz Antenna Port



Test Equipment:

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
	ANUFL Adapter	Test Data Adjustment		1/14/2022	1/14/2024
	ANP05961	Cable	Heliac	6/9/2021	6/9/2023
T1	AN02872	Spectrum Analyzer	E4440A	11/29/2021	11/29/2023

Measurement Data:

Reading listed by margin.

Test Lead: Antenna Port

#	Freq MHz	Rdng dBμV	T1 dB				Dist Table	Corr dBμV	Spec dBμV	Margin dB	Polar Ant
1	5757.800M	110.9	+0.0				+0.0	110.9	124.0	-13.1	Anten
									MCS0, 20dBm		
2	5792.600M	110.7	+0.0				+0.0	110.7	124.0	-13.3	Anten
									MCS0, 20dBm		



Test Location: CKC Laboratories, Inc. • 22116 23rd Drive SE, Suite A • Bothell, WA 98021 • 1-800-500-4EMC (4362)
 Customer: **Nalloy, LLC**
 Specification: **15.407(a)(3) Power Spectral Density**
 Work Order #: **106407** Date: 1/27/2022
 Test Type: **Conducted Emissions** Time: 14:38:00
 Tested By: M. Harrison Sequence#: 64
 Software: EMITest 5.03.20 120V 60Hz

Equipment Tested:

Device	Manufacturer	Model #	S/N
Configuration 1			

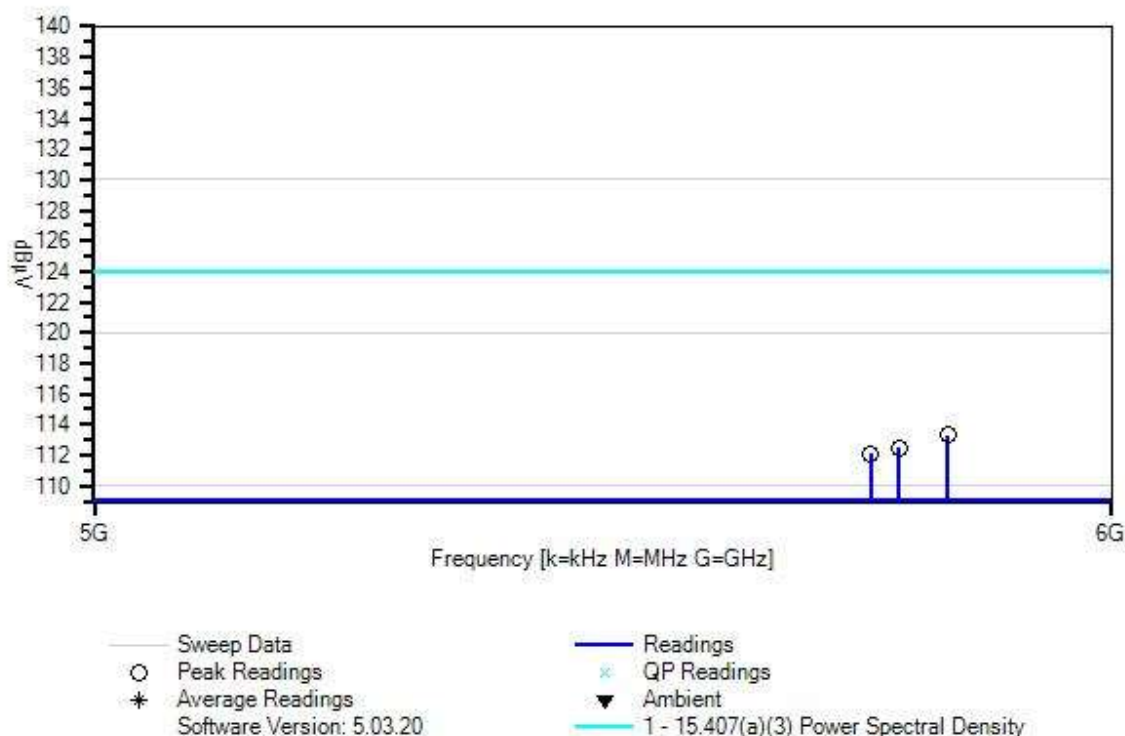
Support Equipment:

Device	Manufacturer	Model #	S/N
Configuration 1			

Test Conditions / Notes:

Environmental Conditions: Temperature: 21°C Humidity: 45% Pressure: 101.2kPa Method: ANSI C63.10: 2013 Frequency range: 5745-5825 MHz Setup: Antenna 0 Channels: 5745, 5775, 5825 MHz 802.11ac20 Band 4 Rate: MCS0-8 PWR Output: 20 dBm 100% Duty Cycle Notes: PSD Measurements were performed with corresponding correction factors applied as an offset in the Spectrum Analyzer.
--

Nalloy, LLC WO#: 106121 Sequence#: 64 Date: 1/27/2022
15.407(a)(3) Power Spectral Density Test Lead: 120V 60Hz Antenna Port



Test Equipment:

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
	ANUFL Adapter	Test Data Adjustment		1/14/2022	1/14/2024
	ANP05961	Cable	Helix	6/9/2021	6/9/2023
T1	AN02872	Spectrum Analyzer	E4440A	11/29/2021	11/29/2023

Measurement Data:

Reading listed by margin.

Test Lead: Antenna Port

#	Freq MHz	Rdng dBμV	T1 dB	dB	dB	dB	Dist Table	Corr dBμV	Spec dBμV	Margin dB	Polar Ant
1	5825.600M	113.3	+0.0				+0.0	113.3	124.0	-10.7	Anten
									MCS0, 20dBm		
2	5775.840M	112.5	+0.0				+0.0	112.5	124.0	-11.5	Anten
									MCS0, 20dBm		
3	5745.870M	112.1	+0.0				+0.0	112.1	124.0	-11.9	Anten
									MCS0, 20dBm		



Test Location: CKC Laboratories, Inc. • 22116 23rd Drive SE, Suite A • Bothell, WA 98021 • 1-800-500-4EMC (4362)
 Customer: **Nalloy, LLC**
 Specification: **15.407(a)(3) Power Spectral Density**
 Work Order #: **106407** Date: 1/27/2022
 Test Type: **Conducted Emissions** Time: 14:50:45
 Tested By: M. Harrison Sequence#: 62
 Software: EMITest 5.03.20 120V 60Hz

Equipment Tested:

Device	Manufacturer	Model #	S/N
Configuration 1			

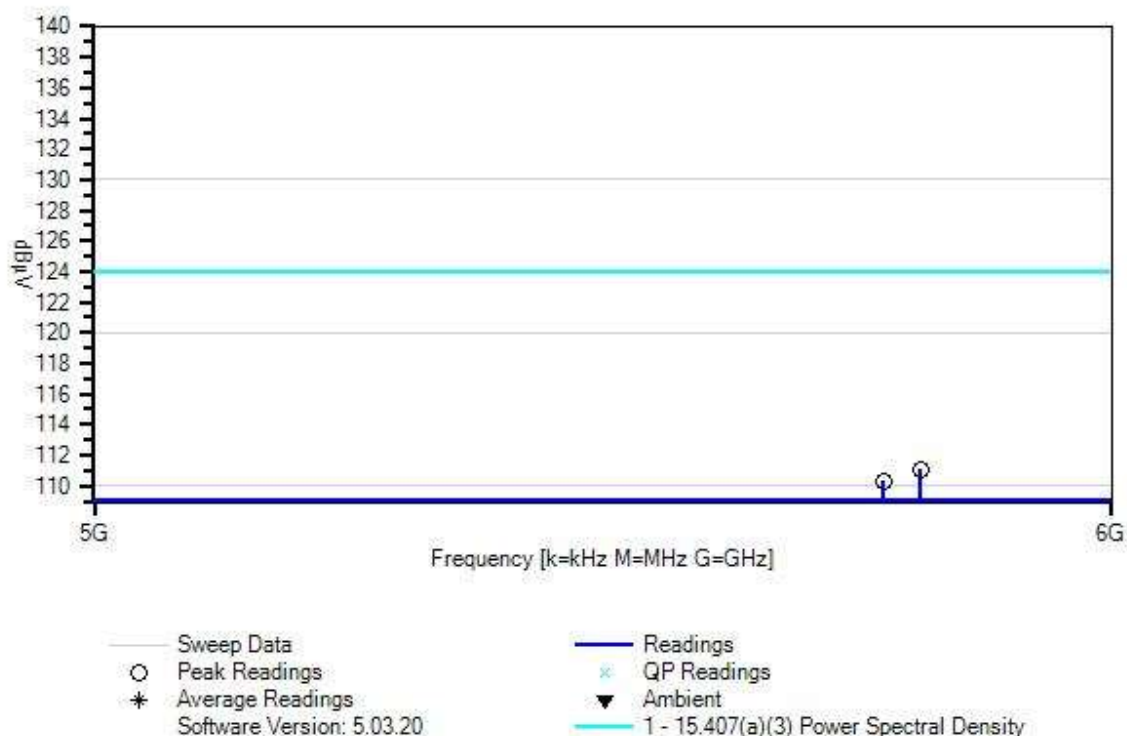
Support Equipment:

Device	Manufacturer	Model #	S/N
Configuration 1			

Test Conditions / Notes:

Environmental Conditions: Temperature: 21°C Humidity: 45% Pressure: 101.2kPa Method: ANSI C63.10: 2013 Frequency range: 5755-5795 MHz Setup: Antenna 0 Channels: 5755, 5795 MHz 802.11ac40 Band 4 Rate: MCS0-9 PWR Output: Low/Mid: 20 dBm, High: 20 dBm 100% Duty Cycle Notes: PSD Measurements were performed with corresponding correction factors applied as an offset in the Spectrum Analyzer.

Nalloy, LLC WO#: 106121 Sequence#: 62 Date: 1/27/2022
15.407(a)(3) Power Spectral Density Test Lead: 120V 60Hz Antenna Port



Test Equipment:

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
	ANUFL Adapter	Test Data Adjustment		1/14/2022	1/14/2024
	ANP05961	Cable	Heliac	6/9/2021	6/9/2023
T1	AN02872	Spectrum Analyzer	E4440A	11/29/2021	11/29/2023

Measurement Data:

Reading listed by margin.

Test Lead: Antenna Port

#	Freq MHz	Rdng dBμV	T1 dB				Dist Table	Corr dBμV	Spec dBμV	Margin dB	Polar Ant
1	5797.850M	111.1	+0.0				+0.0	111.1	124.0	-12.9	Anten
									MCS0, 20dBm		
2	5758.800M	110.3	+0.0				+0.0	110.3	124.0	-13.7	Anten
									MCS0, 20dBm		



Test Location: CKC Laboratories, Inc. • 22116 23rd Drive SE, Suite A • Bothell, WA 98021 • 1-800-500-4EMC (4362)
Customer: **Nalloy, LLC**
Specification: **15.407(a)(3) Power Spectral Density**
Work Order #: **106407** Date: 1/27/2022
Test Type: **Conducted Emissions** Time: 14:57:07
Tested By: M. Harrison Sequence#: 61
Software: EMITest 5.03.20 120V 60Hz

Equipment Tested:

Device	Manufacturer	Model #	S/N
Configuration 1			

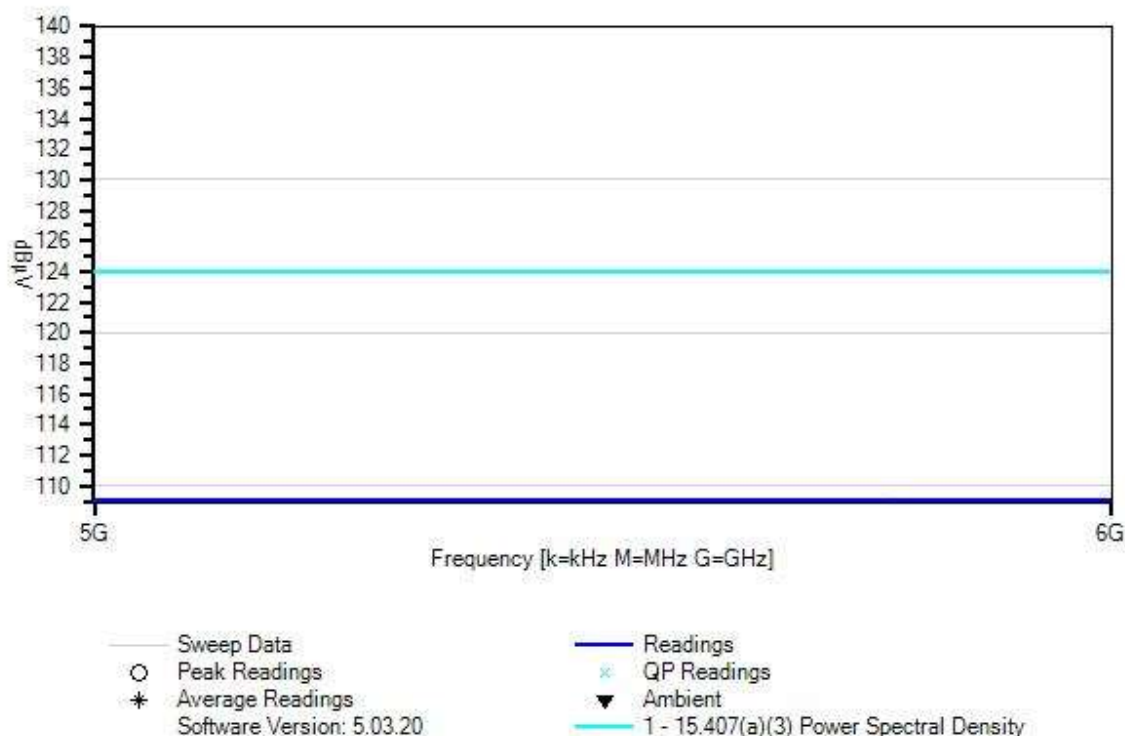
Support Equipment:

Device	Manufacturer	Model #	S/N
Configuration 1			

Test Conditions / Notes:

Environmental Conditions: Temperature: 21°C Humidity: 45% Pressure: 101.2kPa Method: ANSI C63.10: 2013 Frequency range: 5775 MHz Setup: Antenna 0 Channels: 5775 MHz 802.11ac80 Band 4 Rate: MCS0-9 PWR Output: 20 dBm 100% Duty Cycle Notes: PSD Measurements were performed with corresponding correction factors applied as an offset in the Spectrum Analyzer.

Nalloy, LLC WO#: 106121 Sequence#: 61 Date: 1/27/2022
15.407(a)(3) Power Spectral Density Test Lead: 120V 60Hz Antenna Port



Test Equipment:

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
	ANUFL Adapter	Test Data Adjustment		1/14/2022	1/14/2024
	ANP05961	Cable	Heliac	6/9/2021	6/9/2023
T1	AN02872	Spectrum Analyzer	E4440A	11/29/2021	11/29/2023

Measurement Data:

Reading listed by margin.

Test Lead: Antenna Port

#	Freq MHz	Rdng dBμV	T1 dB				Dist Table	Corr dBμV	Spec dBμV	Margin dB	Polar Ant
1	5768.600M	107.3	+0.0				+0.0	107.3	124.0	-16.7	Anten
MCS0, 20dBm											

15.407(b) Radiated Emissions & Band Edge

Test Data

Test Location: CKC Laboratories, Inc. • 22116 23rd Drive SE, Suite A • Bothell, WA 98021 • 1-800-500-4EMC (4362)
 Customer: **Nalloy, LLC**
 Specification: **15.407(b) / 15.209 Radiated Spurious Emissions**
 Work Order #: **106407** Date: 1/18/2022
 Test Type: **Maximized Emissions** Time: 13:45:27
 Tested By: M. Harrison Sequence#: 34
 Software: EMITest 5.03.20

Equipment Tested:

Device	Manufacturer	Model #	S/N
Configuration 1			

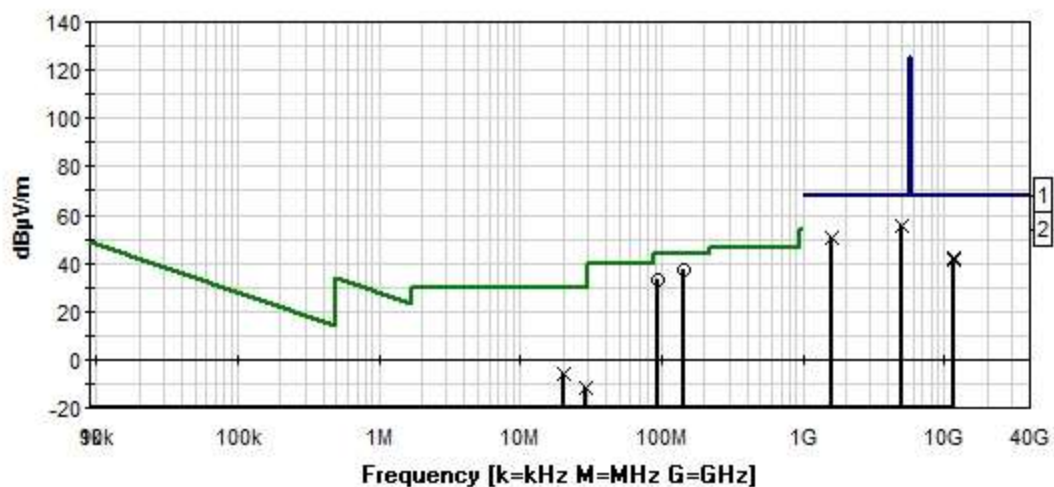
Support Equipment:

Device	Manufacturer	Model #	S/N
Configuration 1			

Test Conditions / Notes:

Environmental Conditions: Temperature: 21°C Humidity: 45% Pressure: 101.2kPa Method: ANSI C63.10: 2013 Frequency range: 9k-40 GHz Setup: Antenna 0 Channels: 5745, 5785, 5825 MHz 802.11a Band 4 Rate: 54Mbps PWR Output: 20 dBm 100% Duty Cycle Notes: No EUT Emissions found within 20 dB of the limit above 18GHz

Nalloy, LLC WO#: 106121 Sequence#: 34 Date: 1/18/2022
 15.407(b) / 15.209 Radiated Spurious Emissions Test Distance: 3 Meters Perp/Para



Test Equipment:

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
	AN02673	Spectrum Analyzer	E4446A	2/3/2021	2/3/2023
T1	ANP05961	Cable	Heliac	6/9/2021	6/9/2023
T2	ANP06515	Cable	Heliac	7/1/2020	7/1/2022
T3	AN02374ANSI	Horn Antenna	RGA-60	5/25/2021	5/25/2023
T4	AN03540	Preamp	83017A	5/14/2021	5/14/2023
T5	ANP06242	Attenuator	54A-10	1/27/2020	1/27/2022
T6	ANP07505	Cable	CLU40-KMKM-02.00F	1/26/2021	1/26/2023
T7	AN02741	Active Horn Antenna	AMFW-5F-12001800-20-10P	5/13/2021	5/13/2023
	AN02742	Active Horn Antenna	AMFW-5F-18002650-20-10P	11/11/2020	11/11/2022
	AN02743	Active Horn Antenna	AMFW-5F-260400-33-8P	5/11/2021	5/11/2023
	AN02763-69	Waveguide	Multiple	4/28/2020	4/28/2022
	AN02764-70	Waveguide	Multiple	4/28/2020	4/28/2022
	ANP06678	Cable	32026-29801-29801-144	2/20/2020	2/20/2022
	ANP07211	Cable	32026-29801-29801-18	6/16/2021	6/16/2023
	ANP07504	Cable	CLU40-KMKM-02.00F	1/26/2021	1/26/2023
T8	AN02307	Preamp	8447D	1/6/2022	1/6/2024
T9	AN03628	Biconilog Antenna	3142E	6/3/2021	6/3/2023
T10	ANP05360	Cable	RG214	2/3/2020	2/3/2022
T11	ANP06011	Cable	Heliac	8/7/2020	8/7/2022
T12	AN00052	Loop Antenna	6502	5/4/2020	5/4/2022

Measurement Data:

Reading listed by margin.

Test Distance: 3 Meters

#	Freq	Rdng	T1	T2	T3	T4	Dist	Corr	Spec	Margin	Polar
			T5	T6	T7	T8					
	MHz	dBμV	T9	T10	T11	T12	Table	dBμV/m	dBμV/m	dB	Ant
1	143.280M	49.8	+0.0	+0.6	+0.0	+0.0	+0.0	37.6	43.5	-5.9	Vert
	QP		+0.0	+0.0	+0.0	-27.6					
			+13.9	+0.7	+0.2	+0.0					
^	143.280M	52.7	+0.0	+0.6	+0.0	+0.0	+0.0	40.5	43.5	-3.0	Vert
			+0.0	+0.0	+0.0	-27.6					
			+13.9	+0.7	+0.2	+0.0					
3	94.376M	46.7	+0.0	+0.5	+0.0	+0.0	+0.0	33.3	43.5	-10.2	Vert
	QP		+0.0	+0.0	+0.0	-27.7					
			+13.1	+0.6	+0.1	+0.0					
^	94.376M	50.6	+0.0	+0.5	+0.0	+0.0	+0.0	37.2	43.5	-6.3	Vert
			+0.0	+0.0	+0.0	-27.7					
			+13.1	+0.6	+0.1	+0.0					
5	4996.000M	39.0	+1.7	+3.8	+33.7	-33.3	+0.0	55.1	68.2	-13.1	Vert
			+9.7	+0.5	+0.0	+0.0					
			+0.0	+0.0	+0.0	+0.0					
6	1567.000M	47.4	+0.8	+2.2	+25.6	-35.1	+0.0	50.8	68.2	-17.4	Vert
			+9.7	+0.2	+0.0	+0.0					
			+0.0	+0.0	+0.0	+0.0					
7	11476.200	45.7	+2.4	+7.0	+0.0	+0.0	+0.0	42.3	68.2	-25.9	Vert
	M		+0.0	+0.0	-12.8	+0.0					
			+0.0	+0.0	+0.0	+0.0					
8	11572.950	45.7	+2.3	+6.9	+0.0	+0.0	+0.0	42.1	68.2	-26.1	Vert
	M		+0.0	+0.0	-12.8	+0.0					
			+0.0	+0.0	+0.0	+0.0					
9	11653.100	45.0	+2.2	+6.9	+0.0	+0.0	+0.0	41.1	68.2	-27.1	Vert
	M		+0.0	+0.0	-13.0	+0.0					
			+0.0	+0.0	+0.0	+0.0					
10	20.269M	26.2	+0.0	+0.2	+0.0	+0.0	-40.0	-6.3	29.5	-35.8	Perp/
			+0.0	+0.0	+0.0	+0.0					
			+0.0	+0.0	+0.0	+7.3					
11	28.687M	22.9	+0.0	+0.3	+0.0	+0.0	-40.0	-11.9	29.5	-41.4	Perp/
			+0.0	+0.0	+0.0	+0.0					
			+0.0	+0.0	+0.1	+4.8					



Test Location: CKC Laboratories, Inc. • 22116 23rd Drive SE, Suite A • Bothell, WA 98021 • 1-800-500-4EMC (4362)
 Customer: **Nalloy, LLC**
 Specification: **15.407(b) / 15.209 Radiated Spurious Emissions**
 Work Order #: **106407** Date: 1/18/2022
 Test Type: **Maximized Emissions** Time: 13:37:05
 Tested By: M. Harrison Sequence#: 33
 Software: EMITest 5.03.20

Equipment Tested:

Device	Manufacturer	Model #	S/N
Configuration 1			

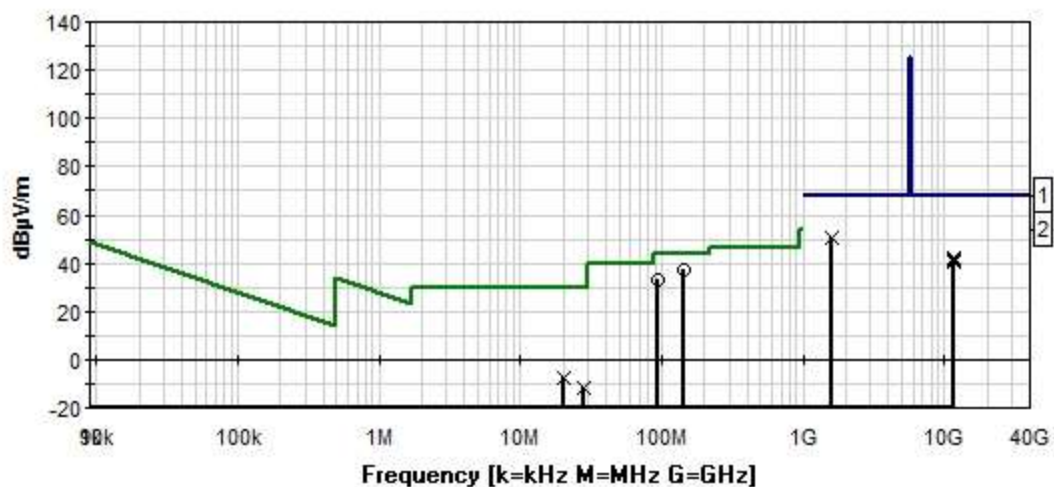
Support Equipment:

Device	Manufacturer	Model #	S/N
Configuration 1			

Test Conditions / Notes:

Environmental Conditions: Temperature: 21°C Humidity: 45% Pressure: 101.2kPa Method: ANSI C63.10: 2013 Frequency range: 9k-40 GHz Setup: Antenna 0 Channels: 5745, 5785, 5825 MHz 802.11n20 Band 4 Rate: MCS0 PWR Output: 20 dBm 100% Duty Cycle Notes: No EUT Emissions found within 20 dB of the limit above 18GHz

Nalloy, LLC WO#: 106121 Sequence#: 33 Date: 1/18/2022
15.407(b) / 15.209 Radiated Spurious Emissions Test Distance: 3 Meters Perp/Para



— Readings
— 1 - 15.407(b)(4) Radiated Spurious Emissions - Client Devices
— 2 - 15.407(b) / 15.209 Radiated Spurious Emissions
× Peak Readings
○ QP Readings
Software Version: 5.03.20

Test Equipment:

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
	AN02673	Spectrum Analyzer	E4446A	2/3/2021	2/3/2023
T1	ANP05961	Cable	Heliac	6/9/2021	6/9/2023
T2	ANP06515	Cable	Heliac	7/1/2020	7/1/2022
T3	AN02374ANSI	Horn Antenna	RGA-60	5/25/2021	5/25/2023
T4	AN03540	Preamp	83017A	5/14/2021	5/14/2023
T5	ANP06242	Attenuator	54A-10	1/27/2020	1/27/2022
T6	ANP07505	Cable	CLU40-KMKM-02.00F	1/26/2021	1/26/2023
T7	AN02741	Active Horn Antenna	AMFW-5F-12001800-20-10P	5/13/2021	5/13/2023
	AN02742	Active Horn Antenna	AMFW-5F-18002650-20-10P	11/11/2020	11/11/2022
	AN02743	Active Horn Antenna	AMFW-5F-260400-33-8P	5/11/2021	5/11/2023
	AN02763-69	Waveguide	Multiple	4/28/2020	4/28/2022
	AN02764-70	Waveguide	Multiple	4/28/2020	4/28/2022
	ANP06678	Cable	32026-29801-29801-144	2/20/2020	2/20/2022
	ANP07211	Cable	32026-29801-29801-18	6/16/2021	6/16/2023
	ANP07504	Cable	CLU40-KMKM-02.00F	1/26/2021	1/26/2023
T8	AN02307	Preamp	8447D	1/6/2022	1/6/2024
T9	AN03628	Biconilog Antenna	3142E	6/3/2021	6/3/2023
T10	ANP05360	Cable	RG214	2/3/2020	2/3/2022
T11	ANP06011	Cable	Heliac	8/7/2020	8/7/2022
T12	AN00052	Loop Antenna	6502	5/4/2020	5/4/2022

Measurement Data:

Reading listed by margin.

Test Distance: 3 Meters

#	Freq	Rdng	T1 T5 T9	T2 T6 T10	T3 T7 T11	T4 T8 T12	Dist	Corr	Spec	Margin	Polar
	MHz	dBμV	dB	dB	dB	dB	Table	dBμV/m	dBμV/m	dB	Ant
1	143.310M QP	49.5	+0.0 +0.0 +13.9	+0.6 +0.0 +0.7	+0.0 +0.0 +0.2	+0.0 -27.6 +0.0	+0.0	37.3	43.5	-6.2	Vert
^	143.310M	53.3	+0.0 +0.0 +13.9	+0.6 +0.0 +0.7	+0.0 +0.0 +0.2	+0.0 -27.6 +0.0	+0.0	41.1	43.5	-2.4	Vert
3	94.376M QP	46.8	+0.0 +0.0 +13.1	+0.5 +0.0 +0.6	+0.0 +0.0 +0.1	+0.0 -27.7 +0.0	+0.0	33.4	43.5	-10.1	Vert
^	94.376M	50.1	+0.0 +0.0 +13.1	+0.5 +0.0 +0.6	+0.0 +0.0 +0.1	+0.0 -27.7 +0.0	+0.0	36.7	43.5	-6.8	Vert
5	1594.000M	47.1	+0.8 +9.7 +0.0	+2.2 +0.2 +0.0	+25.5 +0.0 +0.0	-35.0 +0.0 +0.0	+0.0	50.5	68.2	-17.7	Vert
6	11490.050 M	45.4	+2.4 +0.0 +0.0	+7.0 +0.0 +0.0	+0.0 -12.8 +0.0	+0.0 +0.0 +0.0	+0.0	42.0	68.2	-26.2	Vert
7	11655.400 M	45.1	+2.1 +0.0 +0.0	+6.9 +0.0 +0.0	+0.0 -13.0 +0.0	+0.0 +0.0 +0.0	+0.0	41.1	68.2	-27.1	Vert
8	11569.900 M	44.5	+2.3 +0.0 +0.0	+6.9 +0.0 +0.0	+0.0 -12.8 +0.0	+0.0 +0.0 +0.0	+0.0	40.9	68.2	-27.3	Vert
9	20.269M	25.3	+0.0 +0.0 +0.0	+0.2 +0.0 +0.0	+0.0 +0.0 +0.0	+0.0 +0.0 +7.3	-40.0	-7.2	29.5	-36.7	Perp/
10	28.299M	22.6	+0.0 +0.0 +0.0	+0.3 +0.0 +0.0	+0.0 +0.0 +0.1	+0.0 +0.0 +4.9	-40.0	-12.1	29.5	-41.6	Perp/



Test Location: CKC Laboratories, Inc. • 22116 23rd Drive SE, Suite A • Bothell, WA 98021 • 1-800-500-4EMC (4362)
 Customer: **Nalloy, LLC**
 Specification: **15.407(b) / 15.209 Radiated Spurious Emissions**
 Work Order #: **106407** Date: 1/18/2022
 Test Type: **Maximized Emissions** Time: 13:34:03
 Tested By: M. Harrison Sequence#: 32
 Software: EMITest 5.03.20

Equipment Tested:

Device	Manufacturer	Model #	S/N
Configuration 1			

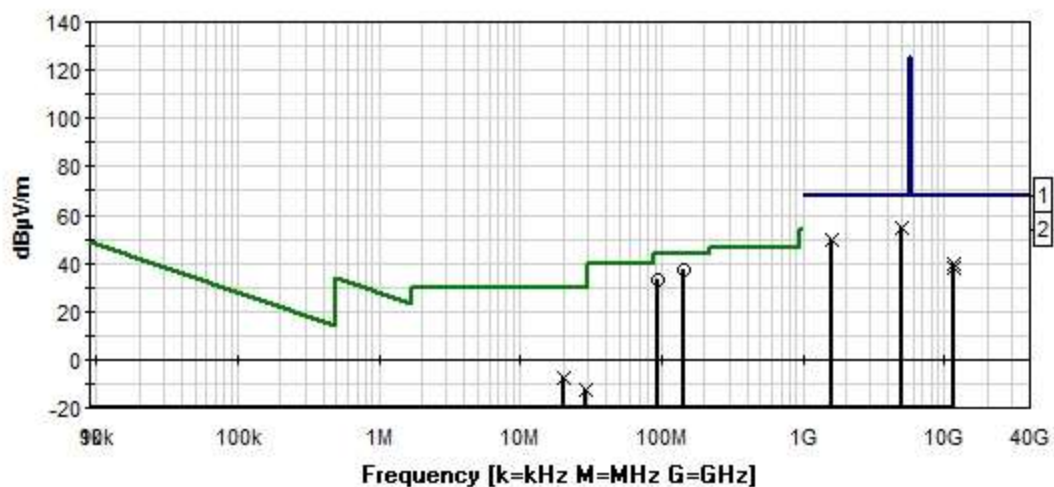
Support Equipment:

Device	Manufacturer	Model #	S/N
Configuration 1			

Test Conditions / Notes:

Environmental Conditions: Temperature: 21°C Humidity: 45% Pressure: 101.2kPa Method: ANSI C63.10: 2013 Frequency range: 9k-40 GHz Setup: Antenna 0 Channels: 5755, 5795 MHz 802.11n40 Band 4 Rate: MCS0 PWR Output: Low/Mid: 20 dBm, High: 20 dBm 100% Duty Cycle Notes: No EUT Emissions found within 20 dB of the limit above 18GHz
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Nalloy, LLC WO#: 106121 Sequence#: 32 Date: 1/18/2022
15.407(b) / 15.209 Radiated Spurious Emissions Test Distance: 3 Meters Perp/Para



- Readings
 - 1 - 15.407(b)(4) Radiated Spurious Emissions - Client Devices
 - 2 - 15.407(b) / 15.209 Radiated Spurious Emissions
 - × Peak Readings
 - QP Readings
- Software Version: 5.03.20

Test Equipment:

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
	AN02673	Spectrum Analyzer	E4446A	2/3/2021	2/3/2023
T1	ANP05961	Cable	Heliac	6/9/2021	6/9/2023
T2	ANP06515	Cable	Heliac	7/1/2020	7/1/2022
T3	AN02374ANSI	Horn Antenna	RGA-60	5/25/2021	5/25/2023
T4	AN03540	Preamp	83017A	5/14/2021	5/14/2023
T5	ANP06242	Attenuator	54A-10	1/27/2020	1/27/2022
T6	ANP07505	Cable	CLU40-KMKM-02.00F	1/26/2021	1/26/2023
T7	AN02741	Active Horn Antenna	AMFW-5F-12001800-20-10P	5/13/2021	5/13/2023
	AN02742	Active Horn Antenna	AMFW-5F-18002650-20-10P	11/11/2020	11/11/2022
	AN02743	Active Horn Antenna	AMFW-5F-260400-33-8P	5/11/2021	5/11/2023
	AN02763-69	Waveguide	Multiple	4/28/2020	4/28/2022
	AN02764-70	Waveguide	Multiple	4/28/2020	4/28/2022
	ANP06678	Cable	32026-29801-29801-144	2/20/2020	2/20/2022
	ANP07211	Cable	32026-29801-29801-18	6/16/2021	6/16/2023
	ANP07504	Cable	CLU40-KMKM-02.00F	1/26/2021	1/26/2023
T8	AN02307	Preamp	8447D	1/6/2022	1/6/2024
T9	AN03628	Biconilog Antenna	3142E	6/3/2021	6/3/2023
T10	ANP05360	Cable	RG214	2/3/2020	2/3/2022
T11	ANP06011	Cable	Heliac	8/7/2020	8/7/2022
T12	AN00052	Loop Antenna	6502	5/4/2020	5/4/2022

Measurement Data:

Reading listed by margin.

Test Distance: 3 Meters

#	Freq	Rdng	T1 T5 T9	T2 T6 T10	T3 T7 T11	T4 T8 T12	Dist	Corr	Spec	Margin	Polar
	MHz	dB μ V	dB	dB	dB	dB	Table	dB μ V/m	dB μ V/m	dB	Ant
1	143.310M QP	49.6	+0.0 +0.0 +13.9	+0.6 +0.0 +0.7	+0.0 +0.0 +0.2	+0.0 -27.6 +0.0	+0.0	37.4	43.5	-6.1	Horiz
^	143.310M	53.1	+0.0 +0.0 +13.9	+0.6 +0.0 +0.7	+0.0 +0.0 +0.2	+0.0 -27.6 +0.0	+0.0	40.9	43.5	-2.6	Horiz
3	94.385M QP	46.5	+0.0 +0.0 +13.1	+0.5 +0.0 +0.6	+0.0 +0.0 +0.1	+0.0 -27.7 +0.0	+0.0	33.1	43.5	-10.4	Horiz
^	94.385M	50.4	+0.0 +0.0 +13.1	+0.5 +0.0 +0.6	+0.0 +0.0 +0.1	+0.0 -27.7 +0.0	+0.0	37.0	43.5	-6.5	Horiz
5	4978.000M	38.2	+1.7 +9.7 +0.0	+3.8 +0.5 +0.0	+33.8 +0.0 +0.0	-33.4 +0.0 +0.0	+0.0	54.3	68.2	-13.9	Vert
6	1585.000M	46.5	+0.8 +9.7 +0.0	+2.2 +0.2 +0.0	+25.6 +0.0 +0.0	-35.0 +0.0 +0.0	+0.0	50.0	68.2	-18.2	Vert
7	11509.300 M	42.9	+2.4 +0.0 +0.0	+7.0 +0.0 +0.0	+0.0 -12.8 +0.0	+0.0 +0.0 +0.0	+0.0	39.5	68.2	-28.7	Horiz
8	11580.900 M	41.9	+2.3 +0.0 +0.0	+6.9 +0.0 +0.0	+0.0 -12.8 +0.0	+0.0 +0.0 +0.0	+0.0	38.3	68.2	-29.9	Horiz
9	20.329M	24.9	+0.0 +0.0 +0.0	+0.2 +0.0 +0.0	+0.0 +0.0 +0.0	+0.0 +0.0 +7.2	-40.0	-7.7	29.5	-37.2	Perp/
10	28.687M	22.3	+0.0 +0.0 +0.0	+0.3 +0.0 +0.0	+0.0 +0.0 +0.1	+0.0 +0.0 +4.8	-40.0	-12.5	29.5	-42.0	Perp/



Test Location: CKC Laboratories, Inc. • 22116 23rd Drive SE, Suite A • Bothell, WA 98021 • 1-800-500-4EMC (4362)
 Customer: **Nalloy, LLC**
 Specification: **15.407(b) / 15.209 Radiated Spurious Emissions**
 Work Order #: **106407** Date: 1/18/2022
 Test Type: **Maximized Emissions** Time: 13:22:27
 Tested By: M. Harrison Sequence#: 31
 Software: EMITest 5.03.20

Equipment Tested:

Device	Manufacturer	Model #	S/N
Configuration 1			

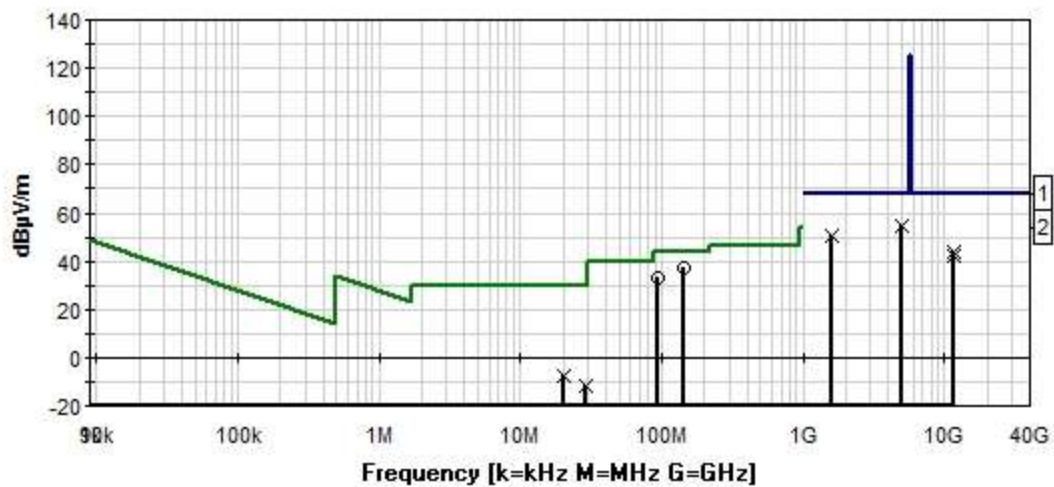
Support Equipment:

Device	Manufacturer	Model #	S/N
Configuration 1			

Test Conditions / Notes:

Environmental Conditions: Temperature: 21°C Humidity: 45% Pressure: 101.2kPa Method: ANSI C63.10: 2013 Frequency range: 9k-40 GHz Setup: Antenna 0 Channels: 5745, 5775, 5825 MHz 802.11ac20 Band 4 Rate: MCS0 PWR Output: Low/Mid: 20 dBm, High: 20 dBm 100% Duty Cycle Notes: No EUT Emissions found within 20 dB of the limit above 18GHz

Nalloy, LLC WO#: 106121 Sequence#: 31 Date: 1/18/2022
15.407(b) / 15.209 Radiated Spurious Emissions Test Distance: 3 Meters Perp/Para



— Readings
— 1 - 15.407(b)(4) Radiated Spurious Emissions - Client Devices
— 2 - 15.407(b) / 15.209 Radiated Spurious Emissions
× Peak Readings
○ QP Readings
Software Version: 5.03.20

Test Equipment:

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
	AN02673	Spectrum Analyzer	E4446A	2/3/2021	2/3/2023
T1	ANP05961	Cable	Heliac	6/9/2021	6/9/2023
T2	ANP06515	Cable	Heliac	7/1/2020	7/1/2022
T3	AN02374ANSI	Horn Antenna	RGA-60	5/25/2021	5/25/2023
T4	AN03540	Preamp	83017A	5/14/2021	5/14/2023
T5	ANP06242	Attenuator	54A-10	1/27/2020	1/27/2022
T6	ANP07505	Cable	CLU40-KMKM-02.00F	1/26/2021	1/26/2023
T7	AN02741	Active Horn Antenna	AMFW-5F-12001800-20-10P	5/13/2021	5/13/2023
	AN02742	Active Horn Antenna	AMFW-5F-18002650-20-10P	11/11/2020	11/11/2022
	AN02743	Active Horn Antenna	AMFW-5F-260400-33-8P	5/11/2021	5/11/2023
	AN02763-69	Waveguide	Multiple	4/28/2020	4/28/2022
	AN02764-70	Waveguide	Multiple	4/28/2020	4/28/2022
	ANP06678	Cable	32026-29801-29801-144	2/20/2020	2/20/2022
	ANP07211	Cable	32026-29801-29801-18	6/16/2021	6/16/2023
	ANP07504	Cable	CLU40-KMKM-02.00F	1/26/2021	1/26/2023
T8	AN02307	Preamp	8447D	1/6/2022	1/6/2024
T9	AN03628	Biconilog Antenna	3142E	6/3/2021	6/3/2023
T10	ANP05360	Cable	RG214	2/3/2020	2/3/2022
T11	ANP06011	Cable	Heliac	8/7/2020	8/7/2022
T12	AN00052	Loop Antenna	6502	5/4/2020	5/4/2022

Measurement Data:

Reading listed by margin.

Test Distance: 3 Meters

#	Freq	Rdng	T1 T5 T9	T2 T6 T10	T3 T7 T11	T4 T8 T12	Dist	Corr	Spec	Margin	Polar
	MHz	dBμV	dB	dB	dB	dB	Table	dBμV/m	dBμV/m	dB	Ant
1	143.297M QP	49.5	+0.0 +0.0 +13.9	+0.6 +0.0 +0.7	+0.0 +0.0 +0.2	+0.0 -27.6 +0.0	+0.0	37.3	43.5	-6.2	Vert
^	143.297M	52.9	+0.0 +0.0 +13.9	+0.6 +0.0 +0.7	+0.0 +0.0 +0.2	+0.0 -27.6 +0.0	+0.0	40.7	43.5	-2.8	Vert
3	94.373M QP	46.7	+0.0 +0.0 +13.1	+0.5 +0.0 +0.6	+0.0 +0.0 +0.1	+0.0 -27.7 +0.0	+0.0	33.3	43.5	-10.2	Vert
^	94.373M	50.5	+0.0 +0.0 +13.1	+0.5 +0.0 +0.6	+0.0 +0.0 +0.1	+0.0 -27.7 +0.0	+0.0	37.1	43.5	-6.4	Vert
5	4987.000M	38.5	+1.7 +9.7 +0.0	+3.8 +0.5 +0.0	+33.8 +0.0 +0.0	-33.4 +0.0 +0.0	+0.0	54.6	68.2	-13.6	Vert
6	1576.000M	47.3	+0.8 +9.7 +0.0	+2.2 +0.2 +0.0	+25.6 +0.0 +0.0	-35.1 +0.0 +0.0	+0.0	50.7	68.2	-17.5	Vert
7	11485.950 M	47.5	+2.4 +0.0 +0.0	+7.0 +0.0 +0.0	+0.0 -12.8 +0.0	+0.0 +0.0 +0.0	+0.0	44.1	68.2	-24.1	Vert
8	11550.550 M	46.0	+2.3 +0.0 +0.0	+7.0 +0.0 +0.0	+0.0 -12.8 +0.0	+0.0 +0.0 +0.0	+0.0	42.5	68.2	-25.7	Vert
9	11655.650 M	46.3	+2.1 +0.0 +0.0	+6.9 +0.0 +0.0	+0.0 -13.0 +0.0	+0.0 +0.0 +0.0	+0.0	42.3	68.2	-25.9	Vert
10	20.299M	24.8	+0.0 +0.0 +0.0	+0.2 +0.0 +0.0	+0.0 +0.0 +0.0	+0.0 +0.0 +7.2	-40.0	-7.8	29.5	-37.3	Perp/
11	28.687M	22.7	+0.0 +0.0 +0.0	+0.3 +0.0 +0.0	+0.0 +0.0 +0.1	+0.0 +0.0 +4.8	-40.0	-12.1	29.5	-41.6	Perp/



Test Location: CKC Laboratories, Inc. • 22116 23rd Drive SE, Suite A • Bothell, WA 98021 • 1-800-500-4EMC (4362)
Customer: **Nalloy, LLC**
Specification: **15.407(b) / 15.209 Radiated Spurious Emissions**
Work Order #: **106407** Date: 1/18/2022
Test Type: **Maximized Emissions** Time: 13:14:14
Tested By: M. Harrison Sequence#: 30
Software: EMITest 5.03.20

Equipment Tested:

Device	Manufacturer	Model #	S/N
Configuration 1			

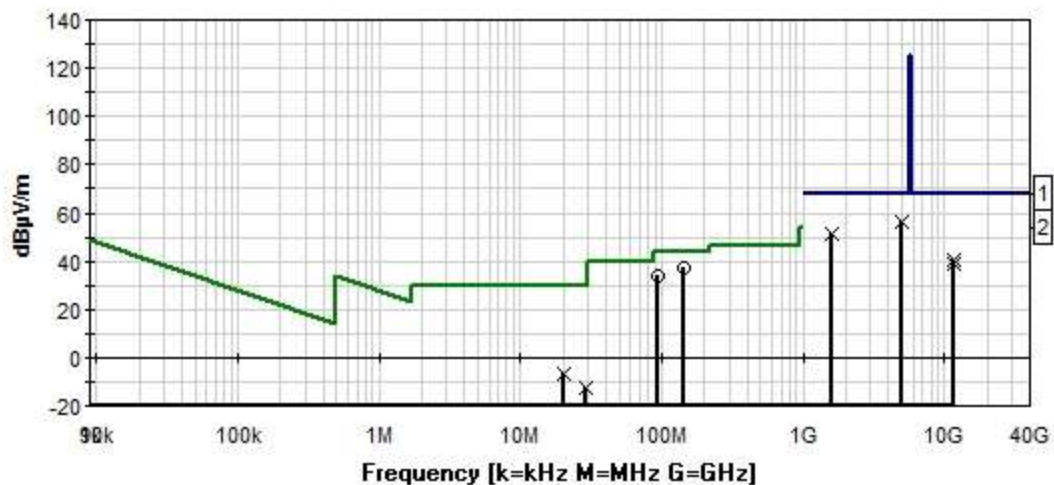
Support Equipment:

Device	Manufacturer	Model #	S/N
Configuration 1			

Test Conditions / Notes:

Environmental Conditions: Temperature: 21°C Humidity: 45% Pressure: 101.2kPa Method: ANSI C63.10: 2013 Frequency range: 9k-40 GHz Setup: Antenna 0 Channels: 5755, 5795 MHz 802.11ac40 Band 4 Rate: MCS0 PWR Output: Low: 20 dBm, High: 20 dBm 100% Duty Cycle Notes: No EUT Emissions found within 20 dB of the limit above 18GHz

Nalloy, LLC WO#: 106121 Sequence#: 30 Date: 1/18/2022
15.407(b) / 15.209 Radiated Spurious Emissions Test Distance: 3 Meters Perp/Para



- Readings
 - 1 - 15.407(b)(4) Radiated Spurious Emissions - Client Devices
 - 2 - 15.407(b) / 15.209 Radiated Spurious Emissions
 - × Peak Readings
 - QP Readings
- Software Version: 5.03.20

Test Equipment:

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
	AN02673	Spectrum Analyzer	E4446A	2/3/2021	2/3/2023
T1	ANP05961	Cable	Heliac	6/9/2021	6/9/2023
T2	ANP06515	Cable	Heliac	7/1/2020	7/1/2022
T3	AN02374ANSI	Horn Antenna	RGA-60	5/25/2021	5/25/2023
T4	AN03540	Preamp	83017A	5/14/2021	5/14/2023
T5	ANP06242	Attenuator	54A-10	1/27/2020	1/27/2022
T6	ANP07505	Cable	CLU40-KMKM-02.00F	1/26/2021	1/26/2023
T7	AN02741	Active Horn Antenna	AMFW-5F-12001800-20-10P	5/13/2021	5/13/2023
	AN02742	Active Horn Antenna	AMFW-5F-18002650-20-10P	11/11/2020	11/11/2022
	AN02743	Active Horn Antenna	AMFW-5F-260400-33-8P	5/11/2021	5/11/2023
	AN02763-69	Waveguide	Multiple	4/28/2020	4/28/2022
	AN02764-70	Waveguide	Multiple	4/28/2020	4/28/2022
	ANP06678	Cable	32026-29801-29801-144	2/20/2020	2/20/2022
	ANP07211	Cable	32026-29801-29801-18	6/16/2021	6/16/2023
	ANP07504	Cable	CLU40-KMKM-02.00F	1/26/2021	1/26/2023
T8	AN02307	Preamp	8447D	1/6/2022	1/6/2024
T9	AN03628	Biconilog Antenna	3142E	6/3/2021	6/3/2023
T10	ANP05360	Cable	RG214	2/3/2020	2/3/2022
T11	ANP06011	Cable	Heliac	8/7/2020	8/7/2022
T12	AN00052	Loop Antenna	6502	5/4/2020	5/4/2022

Measurement Data:

Reading listed by margin.

Test Distance: 3 Meters

#	Freq	Rdng	T1 T5 T9	T2 T6 T10	T3 T7 T11	T4 T8 T12	Dist	Corr	Spec	Margin	Polar
	MHz	dBμV	dB	dB	dB	dB	Table	dBμV/m	dBμV/m	dB	Ant
1	143.302M QP	49.5	+0.0 +0.0 +13.9	+0.6 +0.0 +0.7	+0.0 +0.0 +0.2	+0.0 -27.6 +0.0	+0.0	37.3	43.5	-6.2	Vert
^	143.302M	53.3	+0.0 +0.0 +13.9	+0.6 +0.0 +0.7	+0.0 +0.0 +0.2	+0.0 -27.6 +0.0	+0.0	41.1	43.5	-2.4	Vert
3	94.370M QP	46.9	+0.0 +0.0 +13.1	+0.5 +0.0 +0.6	+0.0 +0.0 +0.1	+0.0 -27.7 +0.0	+0.0	33.5	43.5	-10.0	Vert
^	94.370M	51.2	+0.0 +0.0 +13.1	+0.5 +0.0 +0.6	+0.0 +0.0 +0.1	+0.0 -27.7 +0.0	+0.0	37.8	43.5	-5.7	Vert
5	4987.000M	40.4	+1.7 +9.7 +0.0	+3.8 +0.5 +0.0	+33.8 +0.0 +0.0	-33.4 +0.0 +0.0	+0.0	56.5	68.2	-11.7	Vert
6	1576.000M	47.8	+0.8 +9.7 +0.0	+2.2 +0.2 +0.0	+25.6 +0.0 +0.0	-35.1 +0.0 +0.0	+0.0	51.2	68.2	-17.0	Vert
7	11510.000 M	44.1	+2.4 +0.0 +0.0	+7.0 +0.0 +0.0	+0.0 -12.8 +0.0	+0.0 +0.0 +0.0	+0.0	40.7	68.2	-27.5	Vert
8	11590.000 M	42.6	+2.3 +0.0 +0.0	+6.9 +0.0 +0.0	+0.0 -12.8 +0.0	+0.0 +0.0 +0.0	+0.0	39.0	68.2	-29.2	Vert
9	20.269M	25.4	+0.0 +0.0 +0.0	+0.2 +0.0 +0.0	+0.0 +0.0 +0.0	+0.0 +0.0 +7.3	-40.0	-7.1	29.5	-36.6	Perp/
10	28.687M	22.4	+0.0 +0.0 +0.0	+0.3 +0.0 +0.0	+0.0 +0.0 +0.1	+0.0 +0.0 +4.8	-40.0	-12.4	29.5	-41.9	Perp/



Test Location: CKC Laboratories, Inc. • 22116 23rd Drive SE, Suite A • Bothell, WA 98021 • 1-800-500-4EMC (4362)
 Customer: **Nalloy, LLC**
 Specification: **15.407(b) / 15.209 Radiated Spurious Emissions**
 Work Order #: **106407** Date: 1/18/2022
 Test Type: **Maximized Emissions** Time: 13:05:38
 Tested By: M. Harrison Sequence#: 29
 Software: EMITest 5.03.20

Equipment Tested:

Device	Manufacturer	Model #	S/N
Configuration 1			

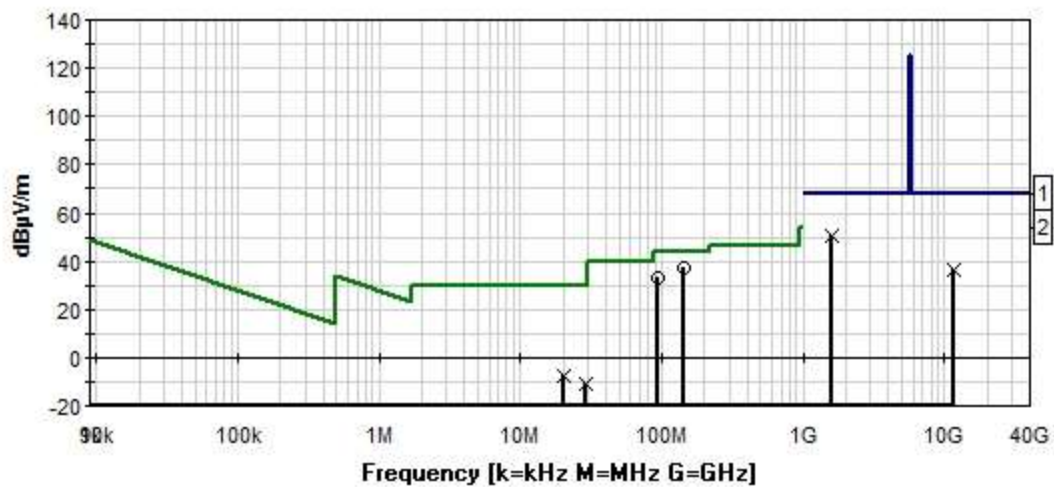
Support Equipment:

Device	Manufacturer	Model #	S/N
Configuration 1			

Test Conditions / Notes:

Temperature: 21°C Humidity: 45% Pressure: 101.2kPa Method: ANSI C63.10: 2013 Frequency range: 9k-40 GHz Setup: Antenna 0 Channels: 5775 MHz 802.11ac80 Band 4 Rate: MCS0 PWR Output: 20 dBm 100% Duty Cycle Notes: No EUT Emissions found within 20 dB of the limit above 18GHz

Nalloy, LLC WO#: 106121 Sequence#: 29 Date: 1/18/2022
15.407(b) / 15.209 Radiated Spurious Emissions Test Distance: 3 Meters Perp/Para



— Readings
— 1 - 15.407(b)(4) Radiated Spurious Emissions - Client Devices
— 2 - 15.407(b) / 15.209 Radiated Spurious Emissions
× Peak Readings
○ QP Readings
Software Version: 5.03.20

Test Equipment:

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
	AN02673	Spectrum Analyzer	E4446A	2/3/2021	2/3/2023
T1	ANP05961	Cable	Heliac	6/9/2021	6/9/2023
T2	ANP06515	Cable	Heliac	7/1/2020	7/1/2022
T3	AN02374ANSI	Horn Antenna	RGA-60	5/25/2021	5/25/2023
T4	AN03540	Preamp	83017A	5/14/2021	5/14/2023
T5	ANP06242	Attenuator	54A-10	1/27/2020	1/27/2022
T6	ANP07505	Cable	CLU40-KMKM-02.00F	1/26/2021	1/26/2023
T7	AN02741	Active Horn Antenna	AMFW-5F-12001800-20-10P	5/13/2021	5/13/2023
	AN02742	Active Horn Antenna	AMFW-5F-18002650-20-10P	11/11/2020	11/11/2022
	AN02743	Active Horn Antenna	AMFW-5F-260400-33-8P	5/11/2021	5/11/2023
	AN02763-69	Waveguide	Multiple	4/28/2020	4/28/2022
	AN02764-70	Waveguide	Multiple	4/28/2020	4/28/2022
	ANP06678	Cable	32026-29801-29801-144	2/20/2020	2/20/2022
	ANP07211	Cable	32026-29801-29801-18	6/16/2021	6/16/2023
	ANP07504	Cable	CLU40-KMKM-02.00F	1/26/2021	1/26/2023
T8	AN02307	Preamp	8447D	1/6/2022	1/6/2024
T9	AN03628	Biconilog Antenna	3142E	6/3/2021	6/3/2023
T10	ANP05360	Cable	RG214	2/3/2020	2/3/2022
T11	ANP06011	Cable	Heliac	8/7/2020	8/7/2022
T12	AN00052	Loop Antenna	6502	5/4/2020	5/4/2022

Measurement Data:

Reading listed by margin.

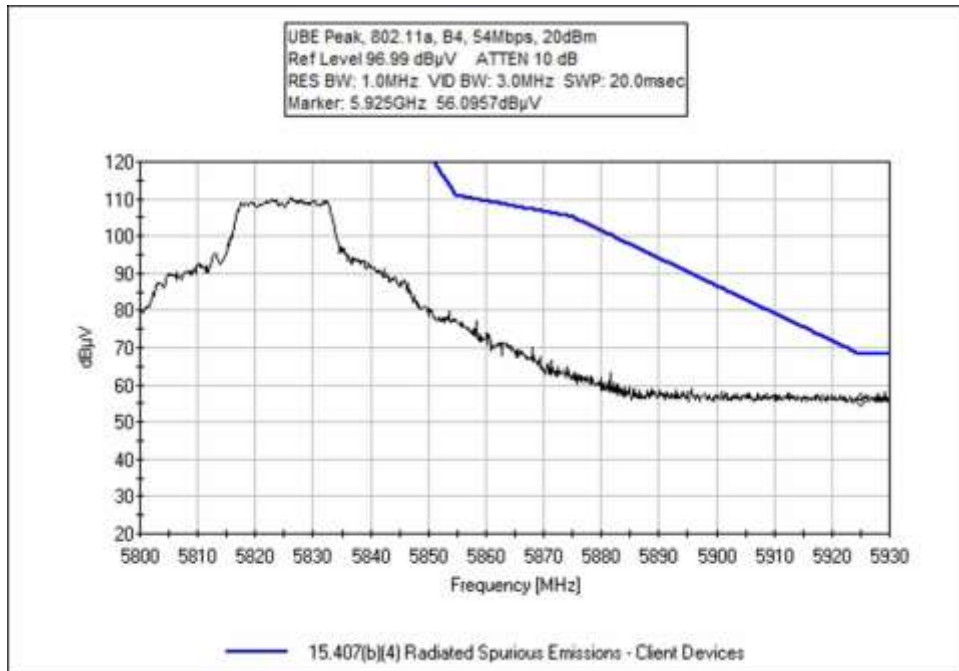
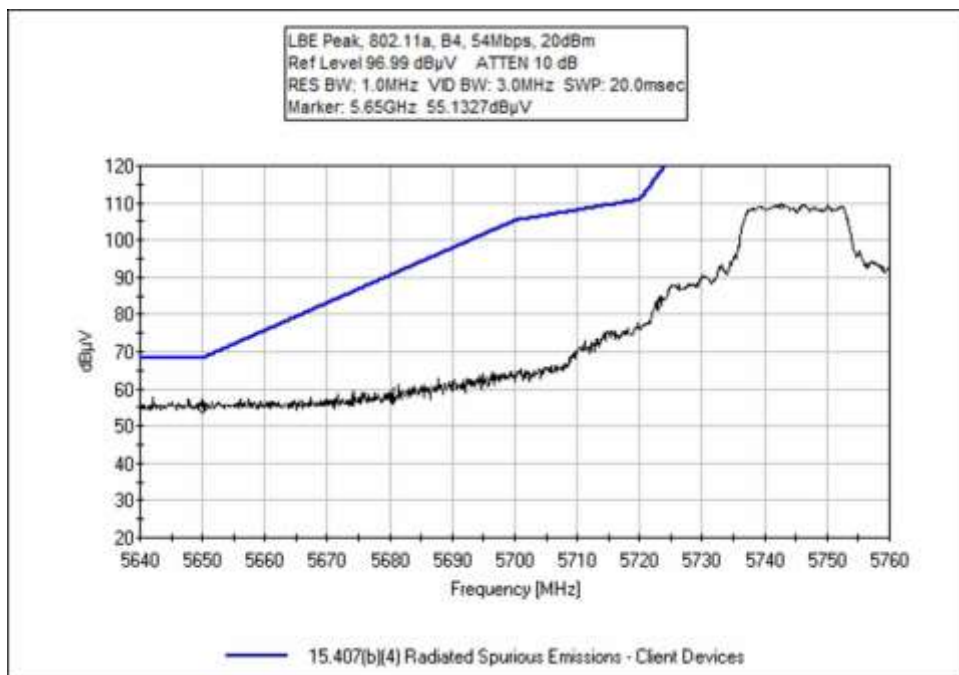
Test Distance: 3 Meters

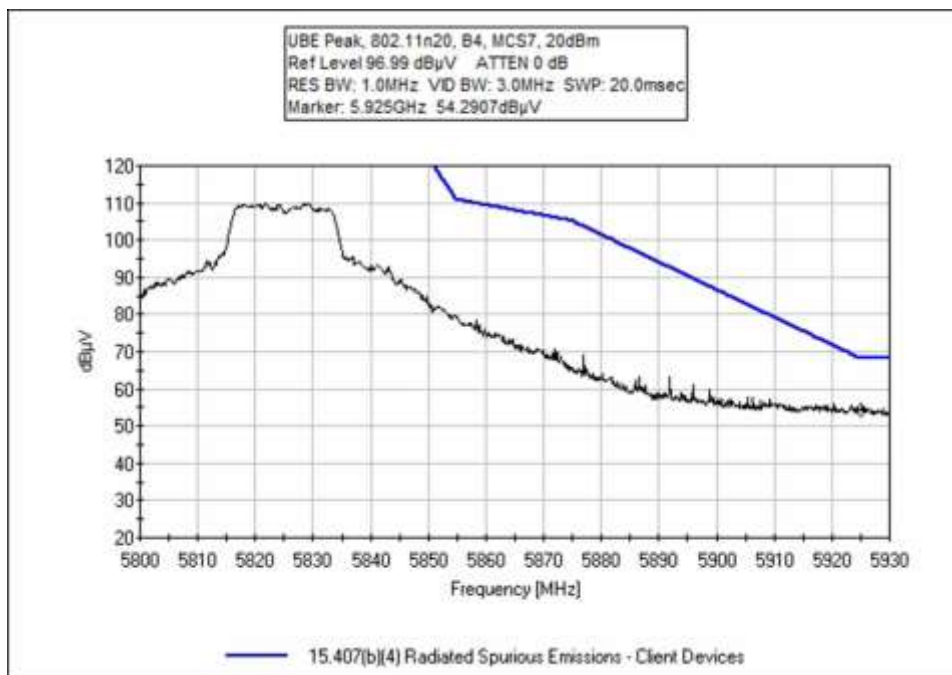
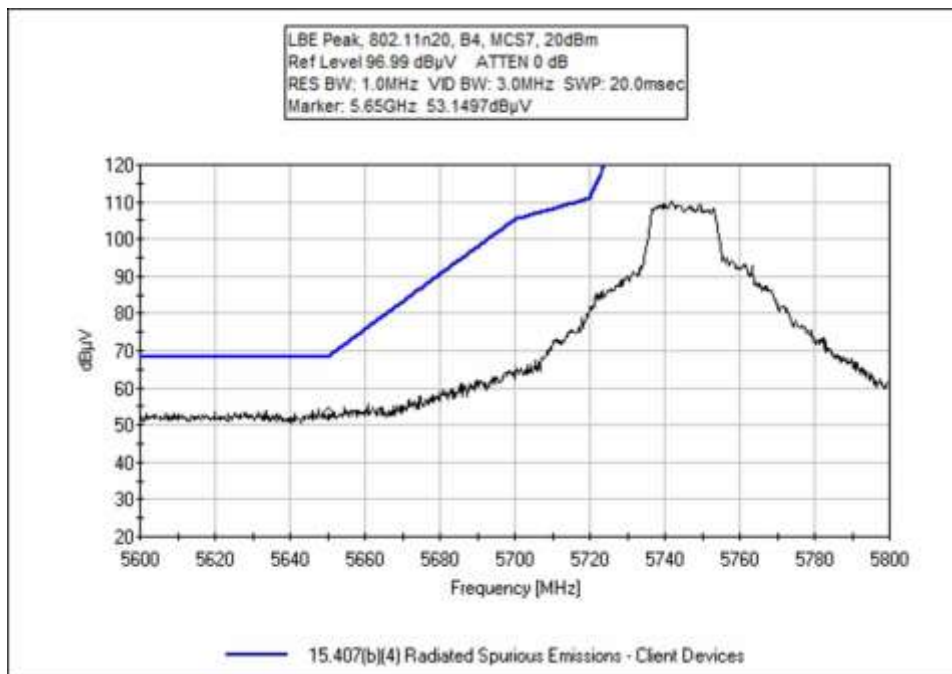
#	Freq	Rdng	T1 T5 T9	T2 T6 T10	T3 T7 T11	T4 T8 T12	Dist	Corr	Spec	Margin	Polar
	MHz	dBμV	dB	dB	dB	dB	Table	dBμV/m	dBμV/m	dB	Ant
1	143.311M QP	49.8	+0.0 +0.0 +13.9	+0.6 +0.0 +0.7	+0.0 +0.0 +0.2	+0.0 -27.6 +0.0	+0.0	37.6	43.5	-5.9	Horiz
^	143.311M	52.9	+0.0 +0.0 +13.9	+0.6 +0.0 +0.7	+0.0 +0.0 +0.2	+0.0 -27.6 +0.0	+0.0	40.7	43.5	-2.8	Horiz
3	94.370M QP	46.7	+0.0 +0.0 +13.1	+0.5 +0.0 +0.6	+0.0 +0.0 +0.1	+0.0 -27.7 +0.0	+0.0	33.3	43.5	-10.2	Horiz
^	94.370M	50.7	+0.0 +0.0 +13.1	+0.5 +0.0 +0.6	+0.0 +0.0 +0.1	+0.0 -27.7 +0.0	+0.0	37.3	43.5	-6.2	Horiz
5	1576.000M	47.2	+0.8 +9.7 +0.0	+2.2 +0.2 +0.0	+25.6 +0.0 +0.0	-35.1 +0.0 +0.0	+0.0	50.6	68.2	-17.6	Horiz
6	11576.880 M	39.8	+2.3 +0.0 +0.0	+6.9 +0.0 +0.0	+0.0 -12.8 +0.0	+0.0 +0.0 +0.0	+0.0	36.2	68.2	-32.0	Horiz
7	20.358M	24.9	+0.0 +0.0 +0.0	+0.2 +0.0 +0.0	+0.0 +0.0 +0.0	+0.0 +0.0 +7.2	-40.0	-7.7	29.5	-37.2	Perp/
8	28.687M	23.6	+0.0 +0.0 +0.0	+0.3 +0.0 +0.0	+0.0 +0.0 +0.1	+0.0 +0.0 +4.8	-40.0	-11.2	29.5	-40.7	Perp/

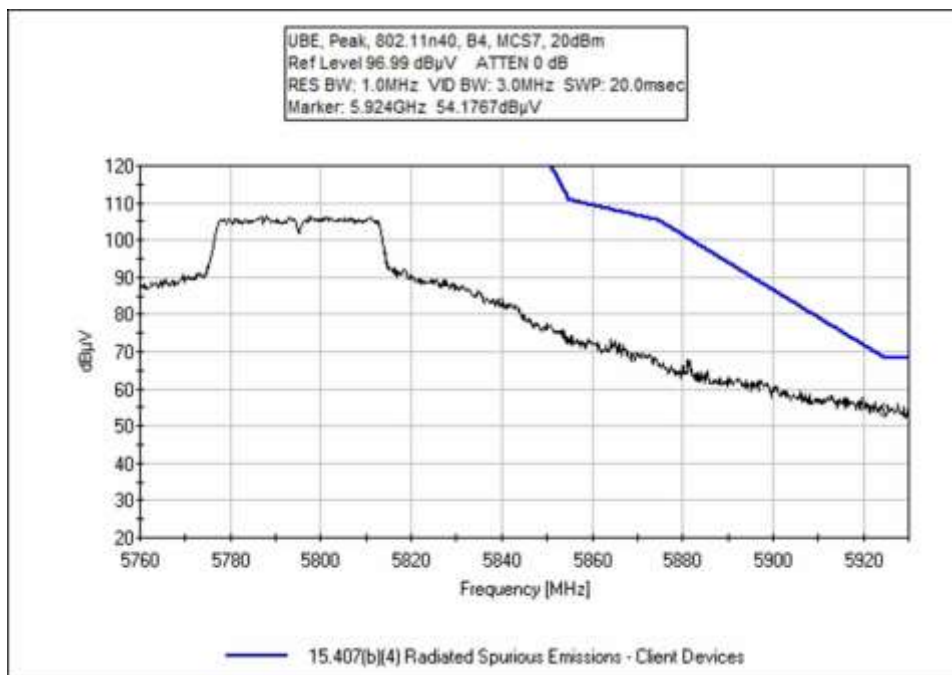
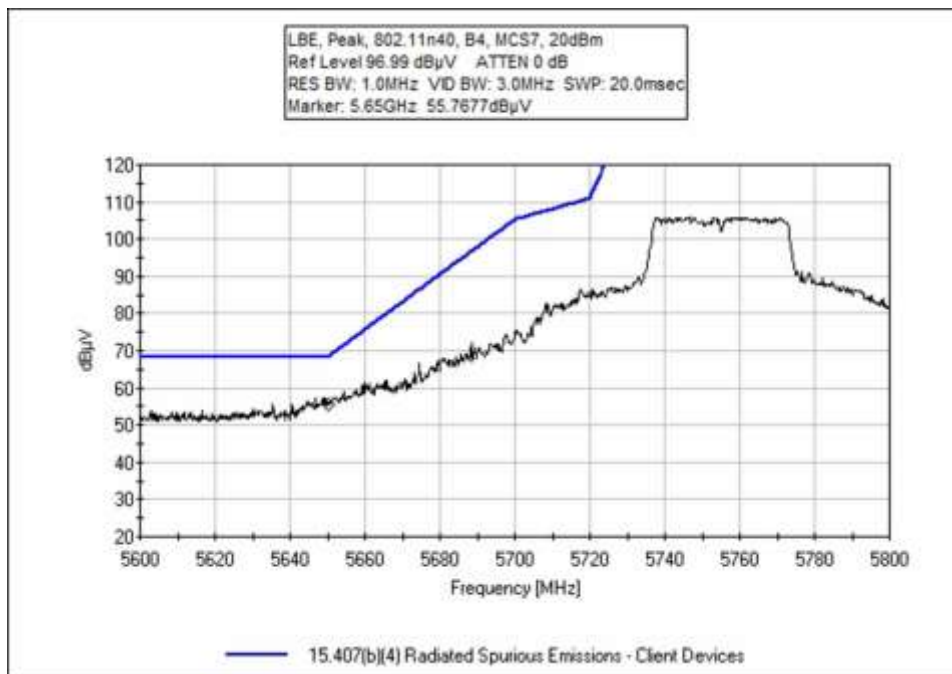
Band Edge Summary					
Frequency (MHz)	Modulation	Ant. Type	Field Strength (dBuV/m @3m)	Limit (dBuV/m @3m)	Results
5650	802.11a	Omnidirectional / 3.8dBi	55.1	< 68.2 Pk	Pass
5925	802.11a	Omnidirectional / 3.8dBi	56.1	< 68.2 Pk	Pass
5650	802.11n20	Omnidirectional / 3.8dBi	53.1	< 68.2 Pk	Pass
5925	802.11n20	Omnidirectional / 3.8dBi	54.3	< 68.2 Pk	Pass
5650	802.11n40	Omnidirectional / 3.8dBi	55.8	< 68.2 Pk	Pass
5925	802.11n40	Omnidirectional / 3.8dBi	54.2	< 68.2 Pk	Pass
5650	802.11ac20	Omnidirectional / 3.8dBi	52.7	< 68.2 Pk	Pass
5925	802.11ac20	Omnidirectional / 3.8dBi	54.1	< 68.2 Pk	Pass
5650	802.11ac40	Omnidirectional / 3.8dBi	58.0	< 68.2 Pk	Pass
5925	802.11ac40	Omnidirectional / 3.8dBi	54.1	< 68.2 Pk	Pass
5650	802.11ac80	Omnidirectional / 3.8dBi	65.0	< 68.2 Pk	Pass
5925	802.11ac80	Omnidirectional / 3.8dBi	61.8	< 68.2 Pk	Pass

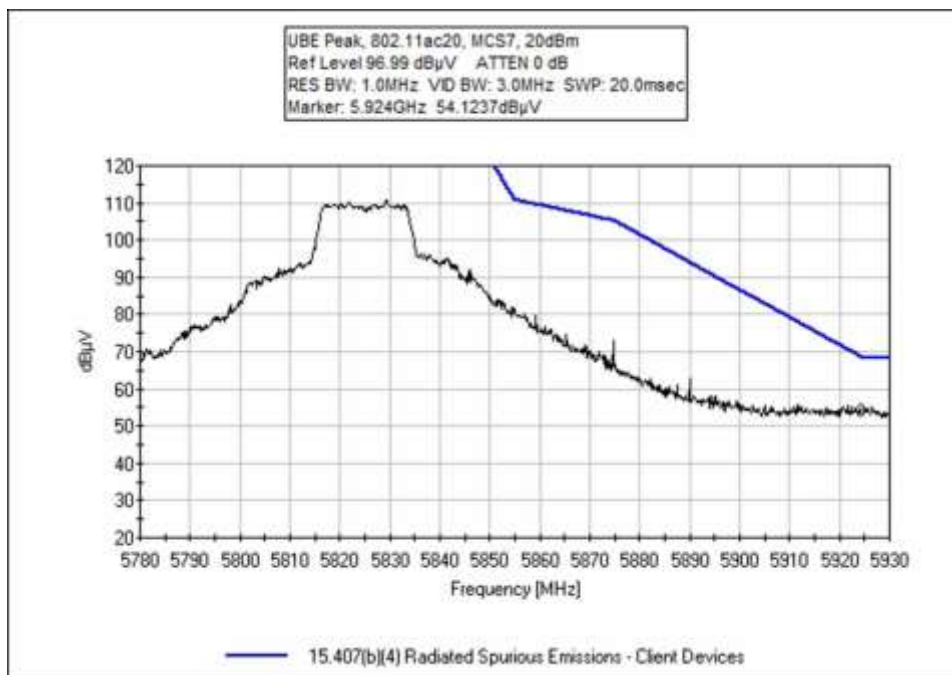
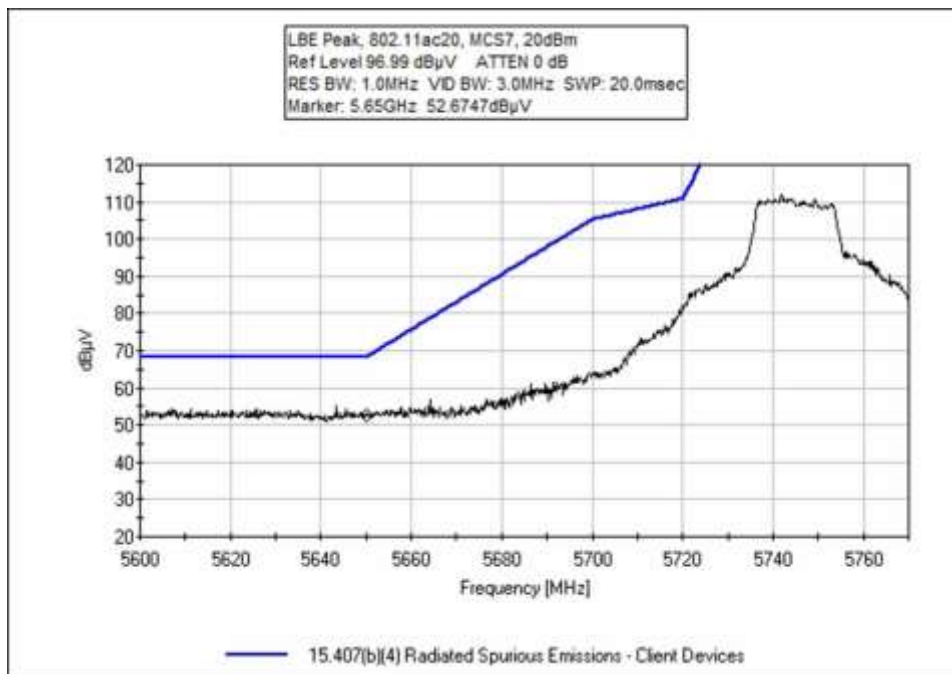
Note: Worst-Case emissions against band edge limits

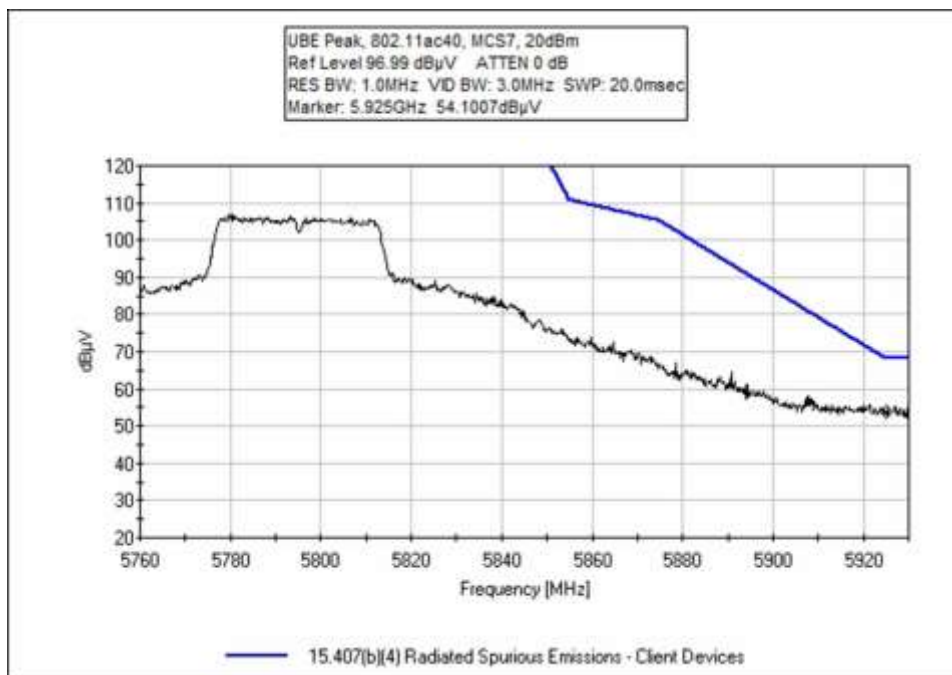
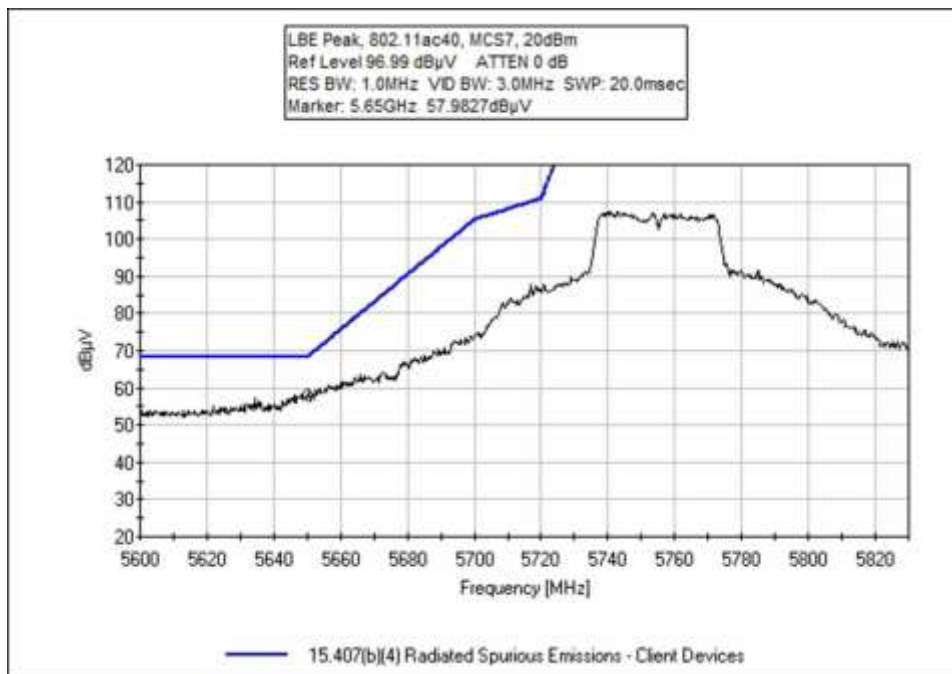
Band Edge Plots

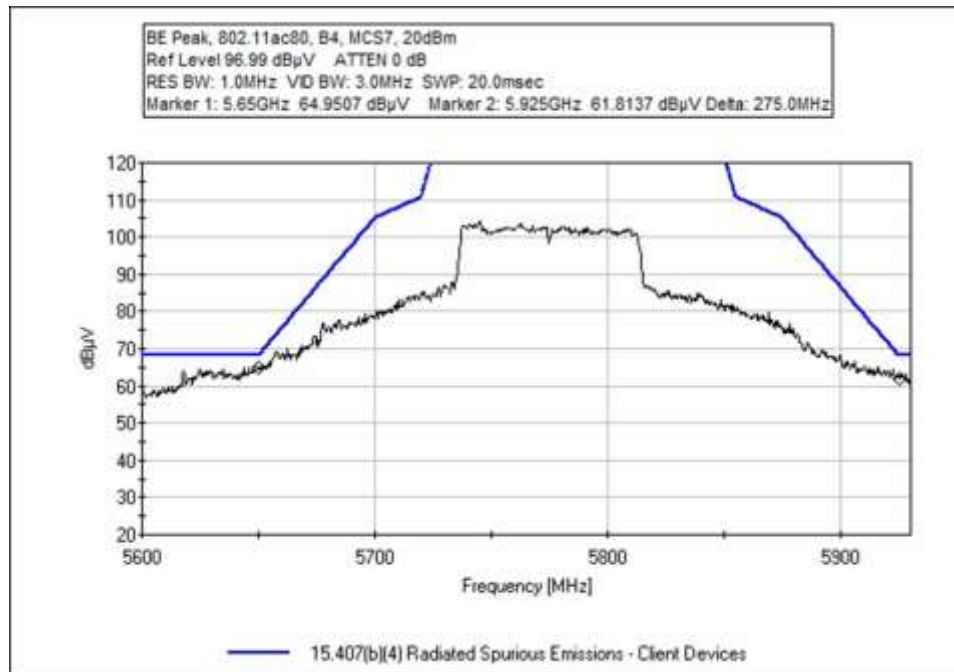












Band Edge Data

Test Location: CKC Laboratories, Inc. • 22116 23rd Drive SE, Suite A • Bothell, WA 98021 • 1-800-500-4EMC (4362)
 Customer: **Nalloy, LLC**
 Specification: **15.407(b)(4) Radiated Spurious Emissions - Client Devices**
 Work Order #: **106407** Date: 1/6/2022
 Test Type: **Maximized Emissions** Time: 13:07:09
 Tested By: M. Harrison Sequence#: 23
 Software: EMITest 5.03.20

Equipment Tested:

Device	Manufacturer	Model #	S/N
Configuration 1			

Support Equipment:

Device	Manufacturer	Model #	S/N
Configuration 1			

Test Conditions / Notes:

Environmental Conditions: Temperature: 21°C Humidity: 45% Pressure: 101.2kPa Method: ANSI C63.10: 2013 Frequency range: 5.65-5.925 GHz Setup: Antenna 0 Channels: 5745, 5825 MHz 802.11a Band 4 Rate: 54Mbps PWR Output: Low/Mid: 20 dBm, High: 20 dBm 100% Duty Cycle Notes: All data rates explored, worst case provided. Band Edge Measurements were performed with correct factors loaded into Spectrum Analyzer.
--

Test Equipment:

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
T1	AN02673	Spectrum Analyzer	E4446A	2/3/2021	2/3/2023
	ANP05961	Cable	Heliac	6/9/2021	6/9/2023
	ANP06515	Cable	Heliac	7/1/2020	7/1/2022
	AN02374ANSI	Horn Antenna	RGA-60	5/25/2021	5/25/2023
	AN03540	Preamplifier	83017A	5/14/2021	5/14/2023
	ANP06242	Attenuator	54A-10	1/27/2020	1/27/2022
	ANP07505	Cable	CLU40-KMKM-02.00F	1/26/2021	1/26/2023

Measurement Data:

Reading listed by margin.

Test Distance: 3 Meters

#	Freq MHz	Rdng dBμV	T1 dB				Dist Table	Corr dBμV/m	Spec dBμV/m	Margin dB	Polar Ant
1	5925.000M	56.1	+0.0				+0.0	56.1	68.2 5825, 54Mbps, 20dBm	-12.1	Horiz
2	5650.000M	55.1	+0.0				+0.0	55.1	68.2 5745, 54Mbps, 20dBm	-13.1	Horiz



Test Location: CKC Laboratories, Inc. • 22116 23rd Drive SE, Suite A • Bothell, WA 98021 • 1-800-500-4EMC (4362)
 Customer: **Nalloy, LLC**
 Specification: **15.407(b)(4) Radiated Spurious Emissions - Client Devices**
 Work Order #: **106407** Date: 1/6/2022
 Test Type: **Maximized Emissions** Time: 13:44:55
 Tested By: M. Harrison Sequence#: 24
 Software: EMITest 5.03.20

Equipment Tested:

Device	Manufacturer	Model #	S/N
Configuration 1			

Support Equipment:

Device	Manufacturer	Model #	S/N
Configuration 1			

Test Conditions / Notes:

Environmental Conditions: Temperature: 21°C Humidity: 45% Pressure: 101.2kPa Method: ANSI C63.10: 2013 Frequency range: 5.65-5.925 GHz Setup: Antenna 0 Channels: 5745, 5825 MHz 802.11n20 Band 4 Rate: MCS7 PWR Output: Low/Mid: 20 dBm, High: 20 dBm 100% Duty Cycle Notes: All data rates explored, worst case provided. Band Edge Measurements were performed with correct factors loaded into Spectrum Analyzer.
--

Test Equipment:

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
T1	AN02673	Spectrum Analyzer	E4446A	2/3/2021	2/3/2023
	ANP05961	Cable	Heliac	6/9/2021	6/9/2023
	ANP06515	Cable	Heliac	7/1/2020	7/1/2022
	AN02374ANSI	Horn Antenna	RGA-60	5/25/2021	5/25/2023
	AN03540	Preamplifier	83017A	5/14/2021	5/14/2023
	ANP06242	Attenuator	54A-10	1/27/2020	1/27/2022
	ANP07505	Cable	CLU40-KMKM-02.00F	1/26/2021	1/26/2023

Measurement Data:

Reading listed by margin.

Test Distance: 3 Meters

#	Freq MHz	Rdng dBμV	T1 dB				Dist Table	Corr dBμV/m	Spec dBμV/m	Margin dB	Polar Ant
1	5925.000M	54.3	+0.0				+0.0	54.3	68.2 5825, MCS7, 20dBm	-13.9	Horiz
2	5650.000M	53.1	+0.0				+0.0	53.1	68.2 5745, MCS7, 20dBm	-15.1	Horiz



Test Location: CKC Laboratories, Inc. • 22116 23rd Drive SE, Suite A • Bothell, WA 98021 • 1-800-500-4EMC (4362)
 Customer: **Nalloy, LLC**
 Specification: **15.407(b)(4) Radiated Spurious Emissions - Client Devices**
 Work Order #: **106407** Date: 1/6/2022
 Test Type: **Maximized Emissions** Time: 14:05:42
 Tested By: M. Harrison Sequence#: 25
 Software: EMITest 5.03.20

Equipment Tested:

Device	Manufacturer	Model #	S/N
Configuration 1			

Support Equipment:

Device	Manufacturer	Model #	S/N
Configuration 1			

Test Conditions / Notes:

Environmental Conditions: Temperature: 21°C Humidity: 45% Pressure: 101.2kPa Method: ANSI C63.10: 2013 Frequency range: 5.65-5.925 GHz Setup: Antenna 0 Channels: 5755, 5795 MHz 802.11n40 Band 4 Rate: MCS7 PWR Output: Low/Mid: 20 dBm, High: 20 dBm 100% Duty Cycle Notes: All data rates explored, worst case provided. Band Edge Measurements were performed with correct factors loaded into Spectrum Analyzer.
--

Test Equipment:

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
T1	AN02673	Spectrum Analyzer	E4446A	2/3/2021	2/3/2023
	ANP05961	Cable	Heliac	6/9/2021	6/9/2023
	ANP06515	Cable	Heliac	7/1/2020	7/1/2022
	AN02374ANSI	Horn Antenna	RGA-60	5/25/2021	5/25/2023
	AN03540	Preamplifier	83017A	5/14/2021	5/14/2023
	ANP06242	Attenuator	54A-10	1/27/2020	1/27/2022
	ANP07505	Cable	CLU40-KMKM-02.00F	1/26/2021	1/26/2023

Measurement Data:

Reading listed by margin.

Test Distance: 3 Meters

#	Freq MHz	Rdng dBμV	T1 dB				Dist Table	Corr dBμV/m	Spec dBμV/m	Margin dB	Polar Ant
1	5650.000M	55.8	+0.0				+0.0	55.8	68.2 5755, MCS7, 20dBm	-12.4	Horiz
2	5924.330M	54.2	+0.0				+0.0	54.2	68.7 5795, MCS7, 20dBm	-14.5	Horiz



Test Location: CKC Laboratories, Inc. • 22116 23rd Drive SE, Suite A • Bothell, WA 98021 • 1-800-500-4EMC (4362)
 Customer: **Nalloy, LLC**
 Specification: **15.407(b)(4) Radiated Spurious Emissions - Client Devices**
 Work Order #: **106407** Date: 1/7/2022
 Test Type: **Maximized Emissions** Time: 07:13:05
 Tested By: M. Harrison Sequence#: 26
 Software: EMITest 5.03.20

Equipment Tested:

Device	Manufacturer	Model #	S/N
Configuration 1			

Support Equipment:

Device	Manufacturer	Model #	S/N
Configuration 1			

Test Conditions / Notes:

Environmental Conditions: Temperature: 21°C Humidity: 45% Pressure: 101.2kPa Method: ANSI C63.10: 2013 Frequency range: 5.65-5.925 GHz Setup: Antenna 0 Channels: 5745, 5825 MHz 802.11ac20 Band 4 Rate: MCS7 PWR Output: Low/Mid: 20 dBm, High: 20 dBm 100% Duty Cycle Notes: All data rates explored, worst case provided. Band Edge Measurements were performed with correct factors loaded into Spectrum Analyzer.

Test Equipment:

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
T1	AN02673	Spectrum Analyzer	E4446A	2/3/2021	2/3/2023
	ANP05961	Cable	Heliac	6/9/2021	6/9/2023
	ANP06515	Cable	Heliac	7/1/2020	7/1/2022
	AN02374ANSI	Horn Antenna	RGA-60	5/25/2021	5/25/2023
	AN03540	Preamplifier	83017A	5/14/2021	5/14/2023
	ANP06242	Attenuator	54A-10	1/27/2020	1/27/2022
	ANP07505	Cable	CLU40-KMKM-02.00F	1/26/2021	1/26/2023

Measurement Data:

Reading listed by margin.

Test Distance: 3 Meters

#	Freq MHz	Rdng dBμV	T1 dB				Dist Table	Corr dBμV/m	Spec dBμV/m	Margin dB	Polar Ant
1	5924.230M	54.1	+0.0				+0.0	54.1	68.8 5825, MCS7, 20dBm	-14.7	Horiz
2	5650.000M	52.7	+0.0				+0.0	52.7	68.2 5745, MCS7, 20dBm	-15.5	Horiz



Test Location: CKC Laboratories, Inc. • 22116 23rd Drive SE, Suite A • Bothell, WA 98021 • 1-800-500-4EMC (4362)
Customer: **Nalloy, LLC**
Specification: **15.407(b)(4) Radiated Spurious Emissions - Client Devices**
Work Order #: **106407** Date: 1/7/2022
Test Type: **Maximized Emissions** Time: 08:08:56
Tested By: M. Harrison Sequence#: 27
Software: EMITest 5.03.20

Equipment Tested:

Device	Manufacturer	Model #	S/N
Configuration 1			

Support Equipment:

Device	Manufacturer	Model #	S/N
Configuration 1			

Test Conditions / Notes:

Environmental Conditions: Temperature: 21°C Humidity: 45% Pressure: 101.2kPa Method: ANSI C63.10: 2013 Frequency range: 5.65-5.925 GHz Setup: Antenna 0 Channels: 5755, 5795 MHz 802.11ac40 Band 4 Rate: MCS7 PWR Output: Low/Mid: 20 dBm, High: 20 dBm 100% Duty Cycle Notes: All data rates explored, worst case provided. Band Edge Measurements were performed with correct factors loaded into Spectrum Analyzer.

Test Equipment:

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
T1	AN02673	Spectrum Analyzer	E4446A	2/3/2021	2/3/2023
	ANP05961	Cable	Heliac	6/9/2021	6/9/2023
	ANP06515	Cable	Heliac	7/1/2020	7/1/2022
	AN02374ANSI	Horn Antenna	RGA-60	5/25/2021	5/25/2023
	AN03540	Preamplifier	83017A	5/14/2021	5/14/2023
	ANP06242	Attenuator	54A-10	1/27/2020	1/27/2022
	ANP07505	Cable	CLU40-KMKM-02.00F	1/26/2021	1/26/2023

Measurement Data:

Reading listed by margin.

Test Distance: 3 Meters

#	Freq MHz	Rdng dBμV	T1 dB				Dist Table	Corr dBμV/m	Spec dBμV/m	Margin dB	Polar Ant
1	5650.000M	58.0	+0.0				+0.0	58.0	68.2 5755, MCS7, 20dBm	-10.2	Horiz
2	5925.000M	54.1	+0.0				+0.0	54.1	68.2 5795, MCS7, 20dBm	-14.1	Horiz



Test Location: CKC Laboratories, Inc. • 22116 23rd Drive SE, Suite A • Bothell, WA 98021 • 1-800-500-4EMC (4362)
 Customer: **Nalloy, LLC**
 Specification: **15.407(b)(4) Radiated Spurious Emissions - Client Devices**
 Work Order #: **106407** Date: 1/7/2022
 Test Type: **Maximized Emissions** Time: 09:01:01
 Tested By: M. Harrison Sequence#: 28
 Software: EMITest 5.03.20

Equipment Tested:

Device	Manufacturer	Model #	S/N
Configuration 1			

Support Equipment:

Device	Manufacturer	Model #	S/N
Configuration 1			

Test Conditions / Notes:

Environmental Conditions: Temperature: 21°C Humidity: 45% Pressure: 101.2kPa Method: ANSI C63.10: 2013 Frequency range: 5.65-5.925 GHz Setup: Antenna 0 Channels: 5775 MHz 802.11ac80 Band 4 Rate: MCS7 PWR Output: 20 dBm 100% Duty Cycle Notes: All data rates explored, worst case provided. Band Edge Measurements were performed with correct factors loaded into Spectrum Analyzer.
--

Test Equipment:

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
T1	AN02673	Spectrum Analyzer	E4446A	2/3/2021	2/3/2023
	ANP05961	Cable	Heliac	6/9/2021	6/9/2023
	ANP06515	Cable	Heliac	7/1/2020	7/1/2022
	AN02374ANSI	Horn Antenna	RGA-60	5/25/2021	5/25/2023
	AN03540	Preamplifier	83017A	5/14/2021	5/14/2023
	ANP06242	Attenuator	54A-10	1/27/2020	1/27/2022
	ANP07505	Cable	CLU40-KMKM-02.00F	1/26/2021	1/26/2023

Measurement Data:

Reading listed by margin.

Test Distance: 3 Meters

#	Freq MHz	Rdng dBμV	T1 dB				Dist Table	Corr dBμV/m	Spec dBμV/m	Margin dB	Polar Ant
1	5650.000M	65.0	+0.0				+0.0	65.0	68.2 5775, MCS7, 20dBm	-3.2	Horiz
2	5925.000M	61.8	+0.0				+0.0	61.8	68.2 5775, MCS7, 20dBm	-6.4	Horiz

15.407(e) Occupied Bandwidth

Test Setup/Conditions			
Test Location:	Bothell Lab Bench	Test Engineer:	S. Pittsford
Test Method:	ANSI C63.10 (2013), KDB 789033	Test Date(s):	1/18/2022
Configuration:	2		
Test Setup:	Duty Cycle: 100% (Test Mode) Test Mode: Continuously transmitting Test Setup: EUT is transmitting through the antenna port connector and is attached to the spectrum analyzer.		

Environmental Conditions			
Temperature (°C)	21	Relative Humidity (%):	43

Test Equipment					
Asset#	Description	Manufacturer	Model	Cal Date	Cal Due
02872	Spectrum Analyzer	Agilent	E4440A	11/29/2021	11/29/2023
P07229	Attenuator	Pasternack	PE7004-20	8/9/2021	8/9/2023
P07796	Cable	Andrews	Helix	7/7/2021	7/7/2023

6dB Occupied Bandwidth

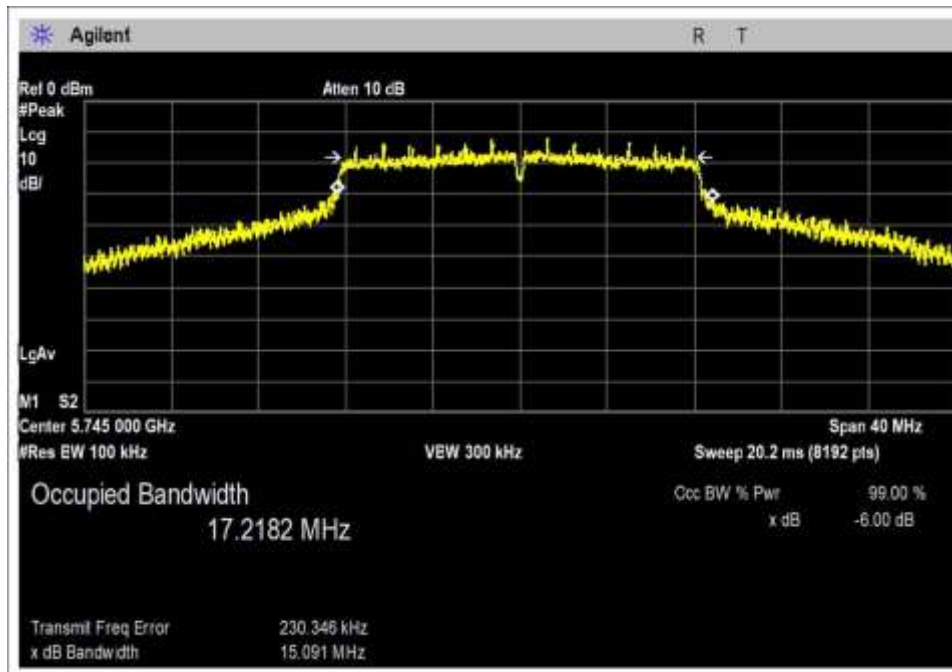
Test Data Summary					
Frequency (MHz)	Antenna Port	Modulation	Measured (kHz)	Limit (kHz)	Results
5745	0	802.11a / 0	15091	≥500	Pass
5785	0	802.11a / 0	15104	≥500	Pass
5825	0	802.11a / 0	15441	≥500	Pass
5745	0	802.11n20 / 0	16510	≥500	Pass
5785	0	802.11n20 / 0	15941	≥500	Pass
5825	0	802.11n20 / 0	16704	≥500	Pass
5755	0	802.11n40 / 0	35668	≥500	Pass
5795	0	802.11n40 / 0	35384	≥500	Pass
5745	0	802.11ac20 / 0	16495	≥500	Pass
5785	0	802.11ac20 / 0	16136	≥500	Pass
5825	0	802.11ac20 / 0	16149	≥500	Pass
5755	0	802.11ac40 / 0	35129	≥500	Pass
5795	0	802.11ac40 / 0	35084	≥500	Pass
5775	0	802.11ac80	75089	≥500	Pass

99% Occupied Bandwidth

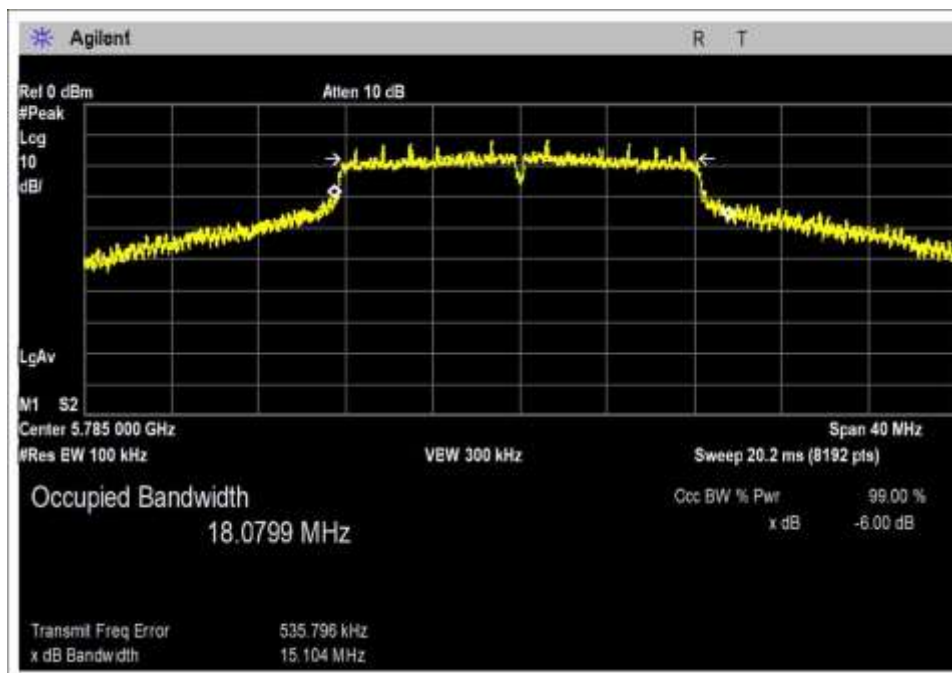
Frequency (MHz)	Antenna Port	Modulation	Measured (kHz)	Limit (kHz)	Results
5745	0	802.11a	18543.3	None	N/A
5785	0	802.11a	18727.0		
5825	0	802.11a	21693.2		
5745	0	802.11n20	19145.4	None	N/A
5785	0	802.11n20	19503.5		
5825	0	802.11n20	22052.8		
5755	0	802.11n40	39111.3	None	N/A
5795	0	802.11n40	44339.5		
5745	0	802.11ac20	19122.7	None	N/A
5785	0	802.11ac20	19660.7		
5825	0	802.11ac20	21441.1		
5755	0	802.11ac40	38920.0	None	N/A
5795	0	802.11ac40	44216.3		
5775	0	802.11ac80	77791.6	None	N/A

Plot(s)

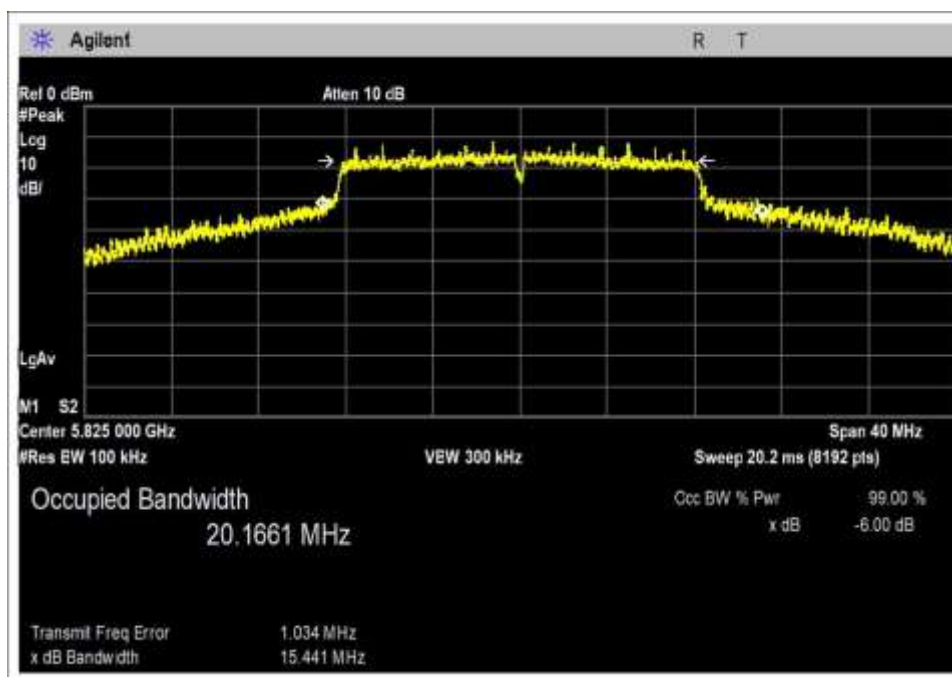
6dB Occupied Bandwidth 802.11a



Low Channel

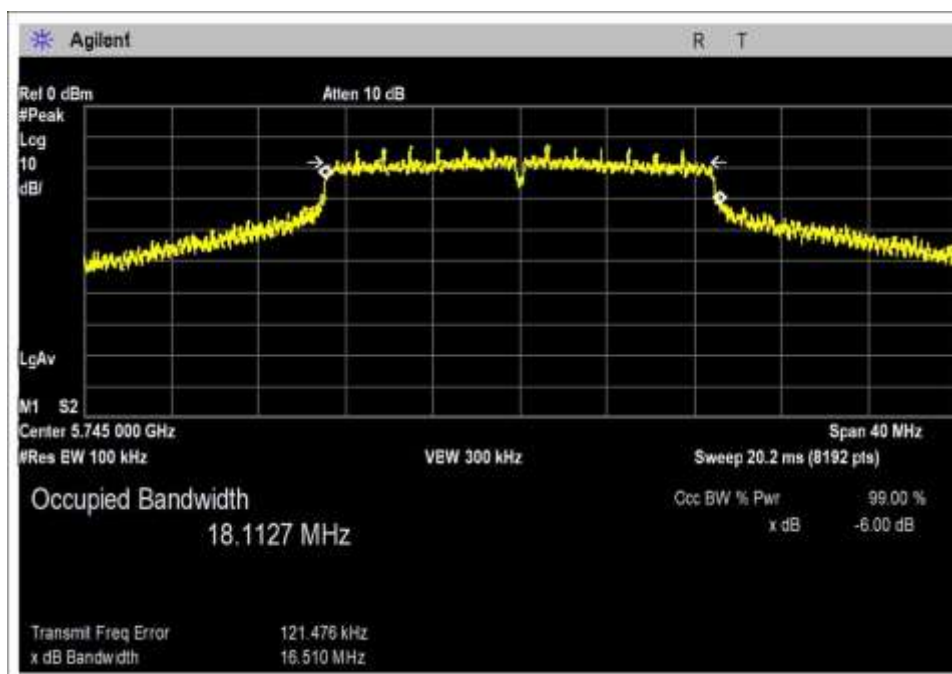


Middle Channel

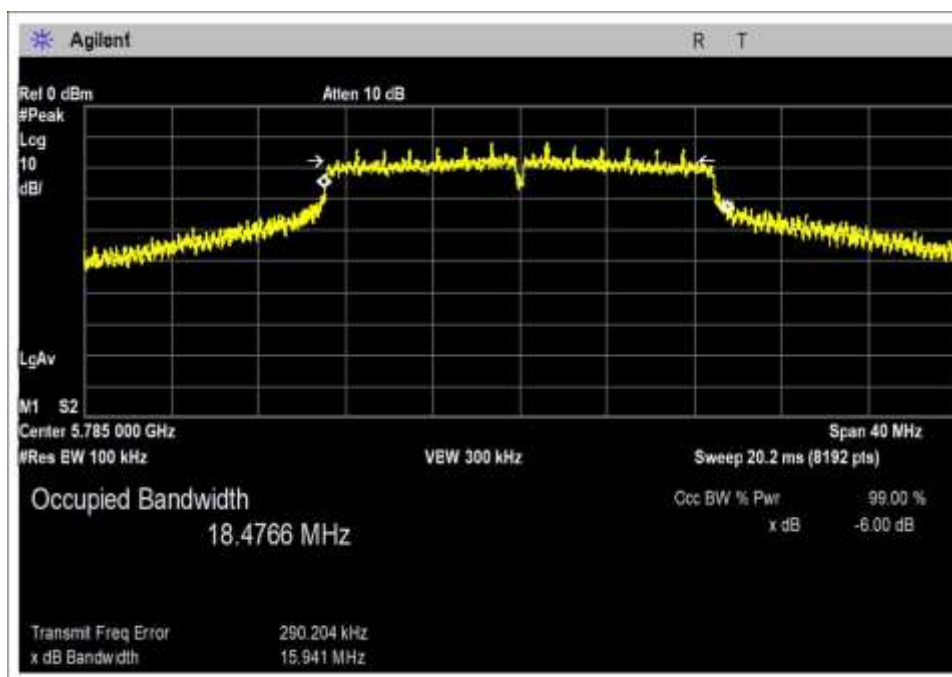


High Channel

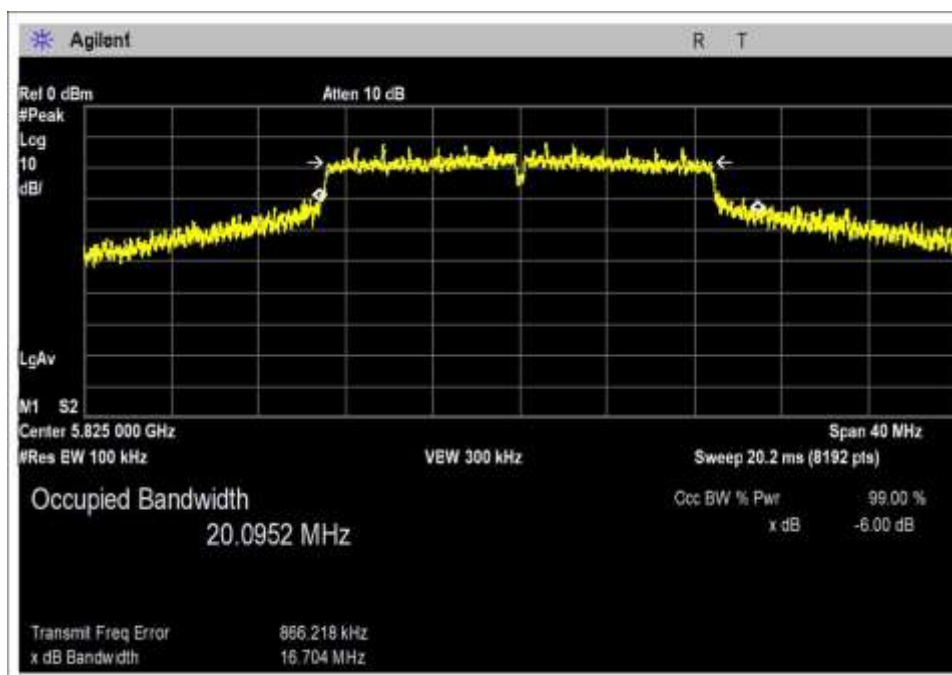
6dB Occupied Bandwidth 802.11n20



Low Channel

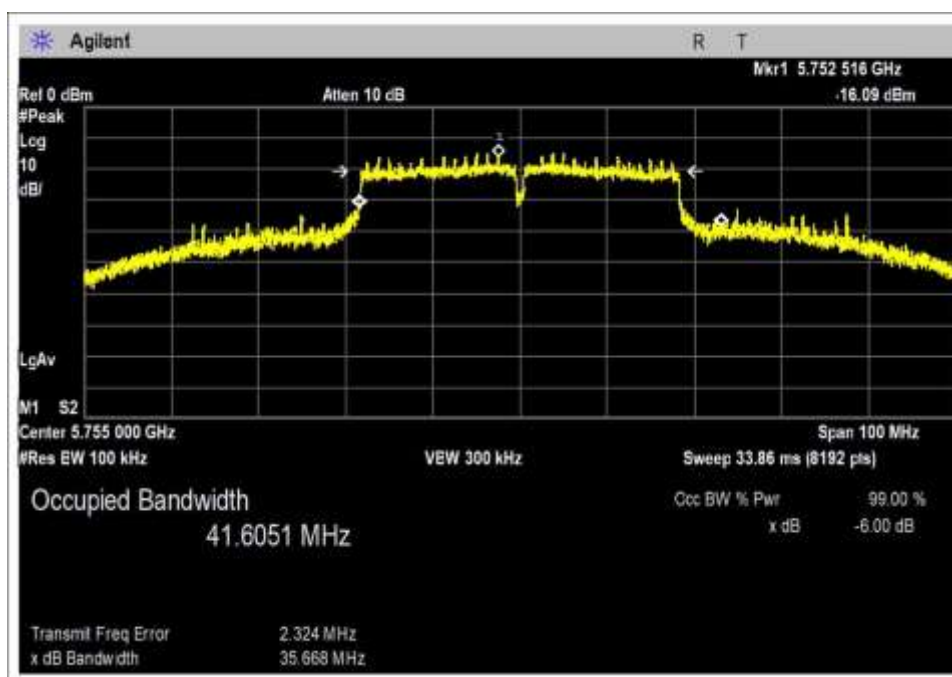


Middle Channel

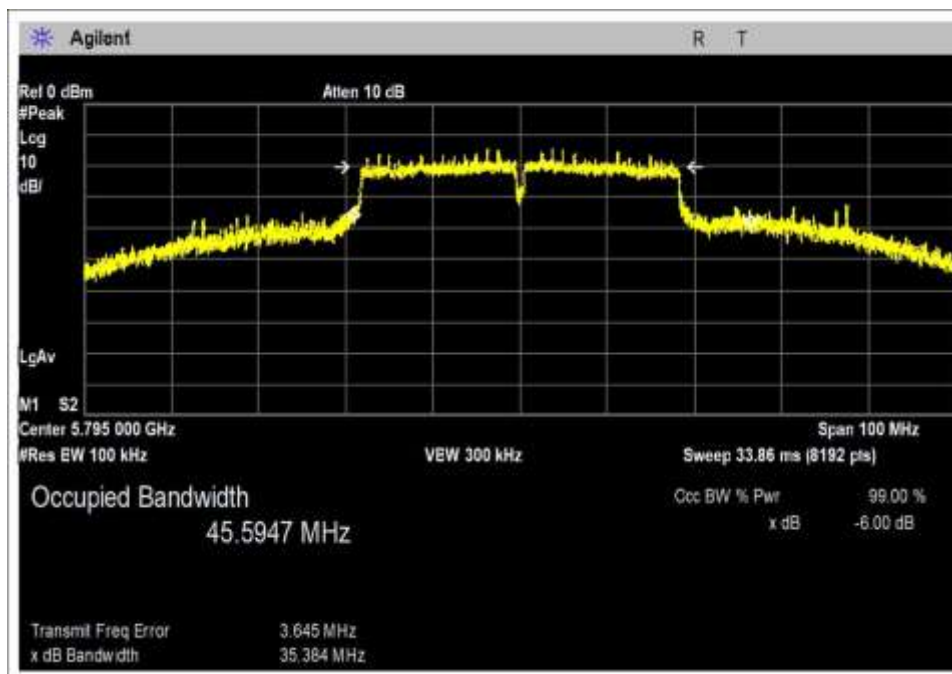


High Channel

6dB Occupied Bandwidth 802.11n40

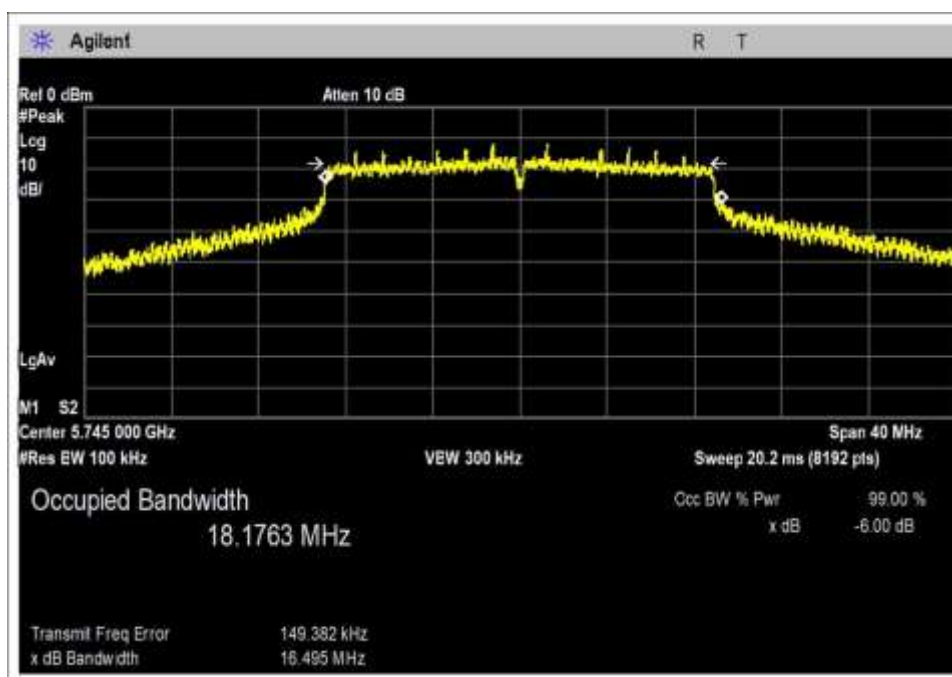


Low Channel

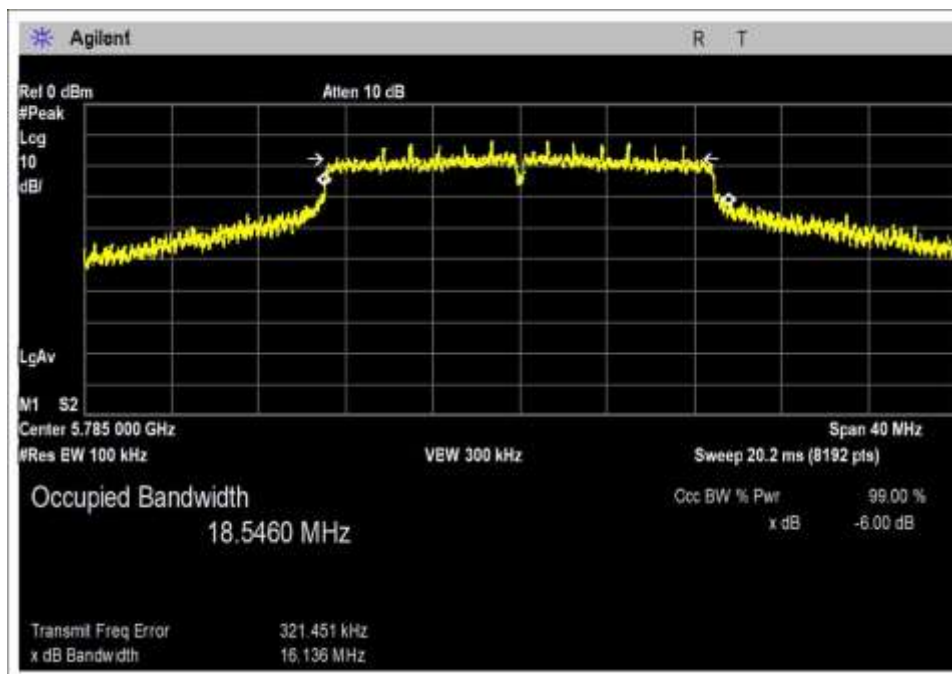


High Channel

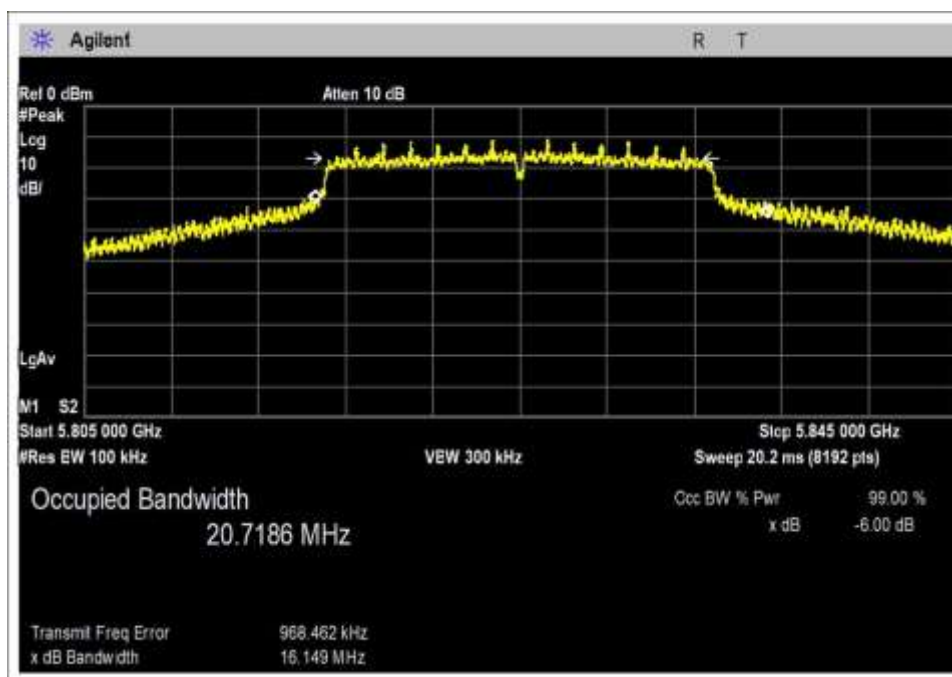
6dB Occupied Bandwidth 802.11ac20



Low Channel

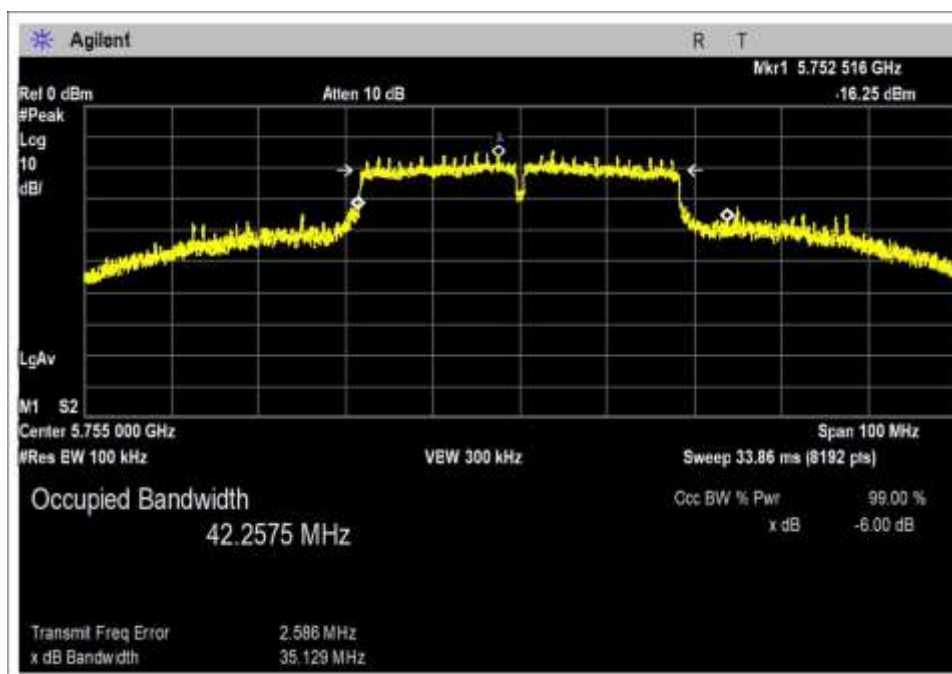


Middle Channel

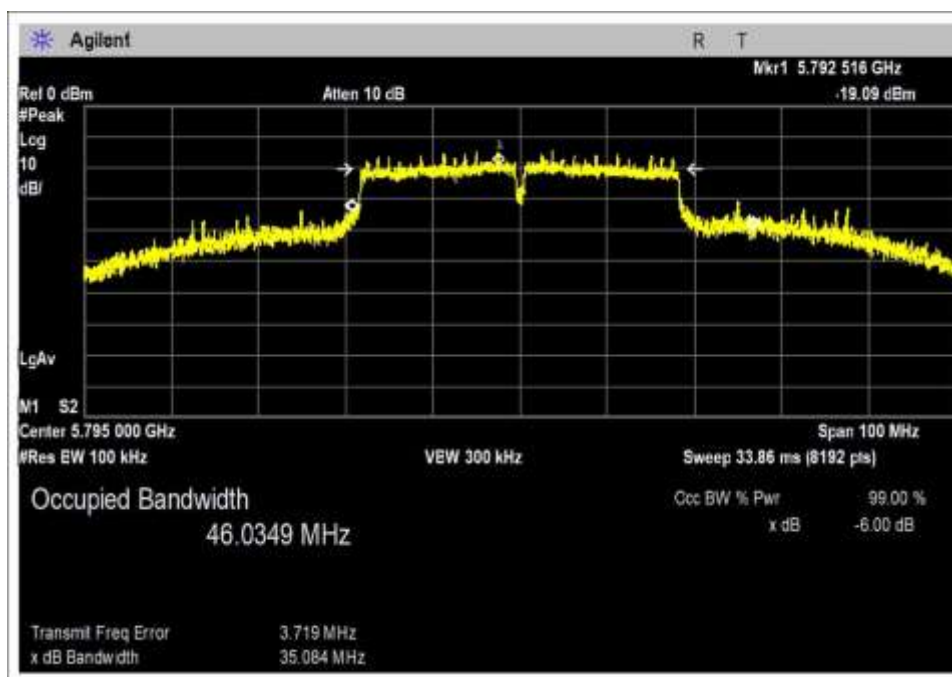


High Channel

6dB Occupied Bandwidth 802.11ac40

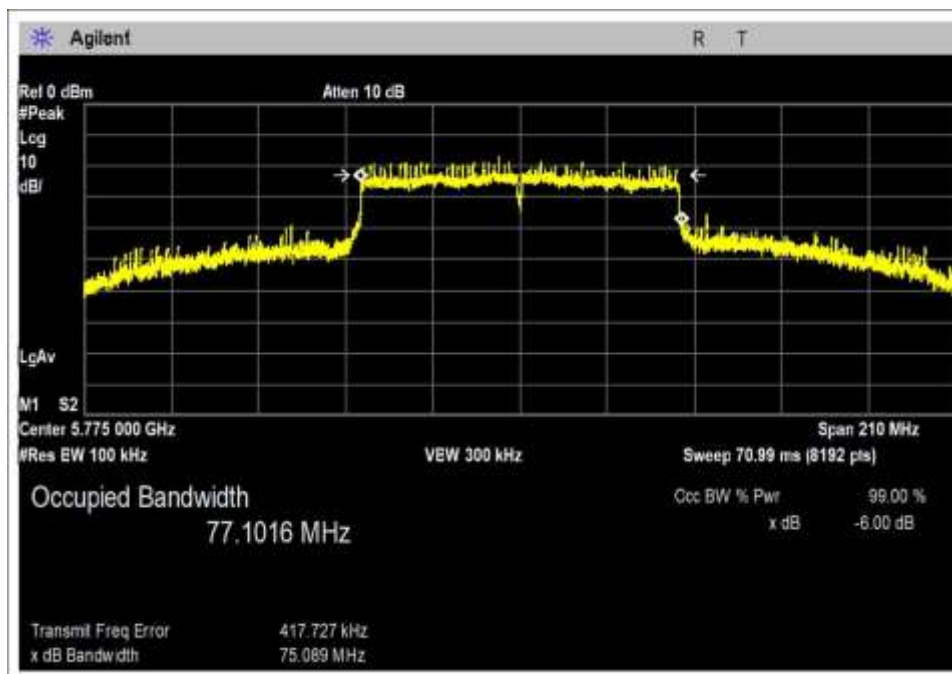


Low Channel

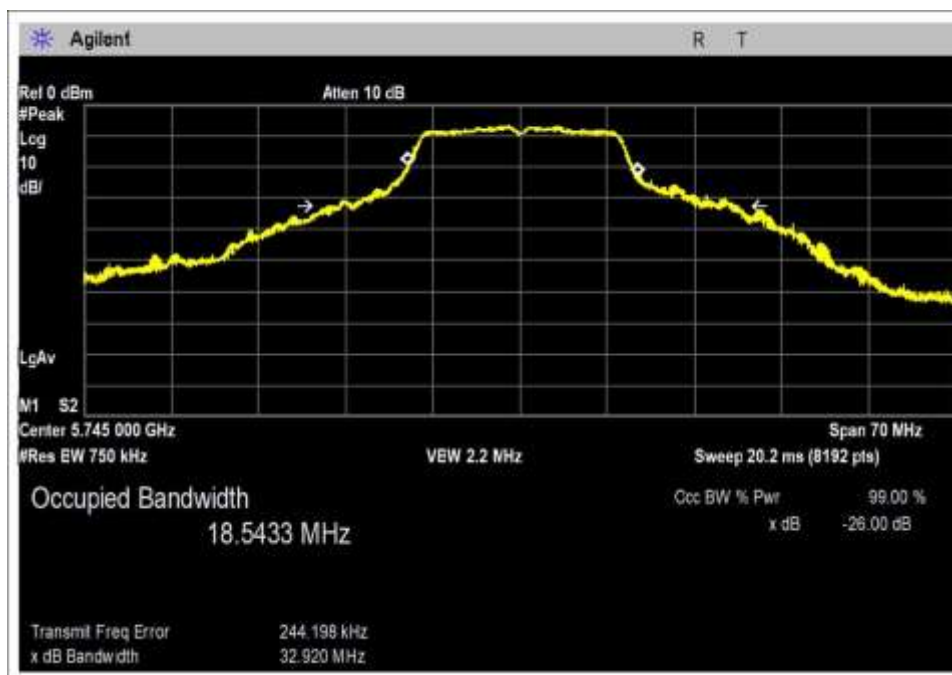


High Channel

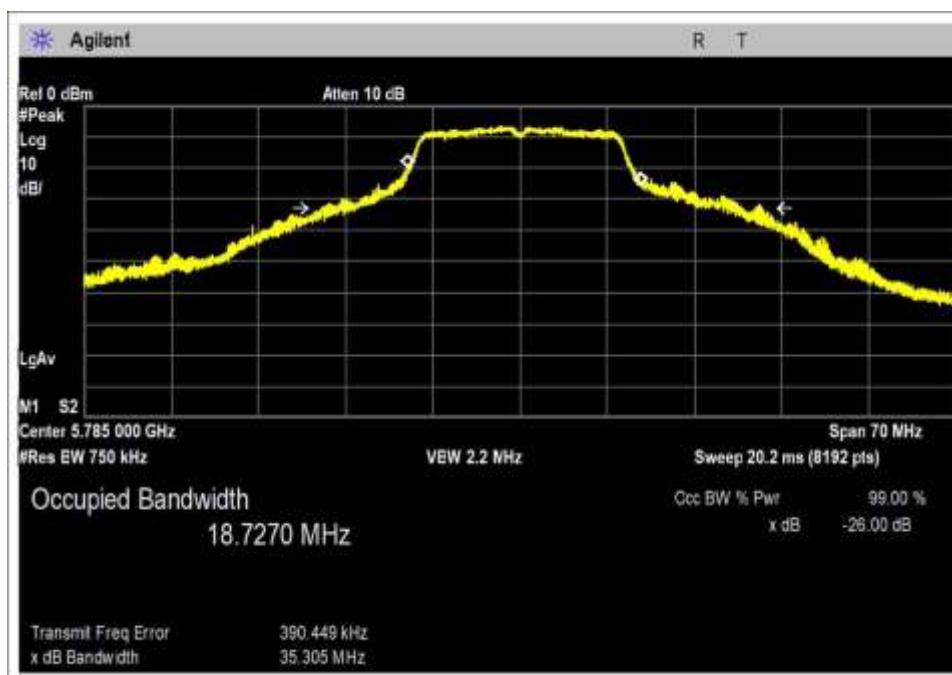
6dB Occupied Bandwidth 802.11ac80



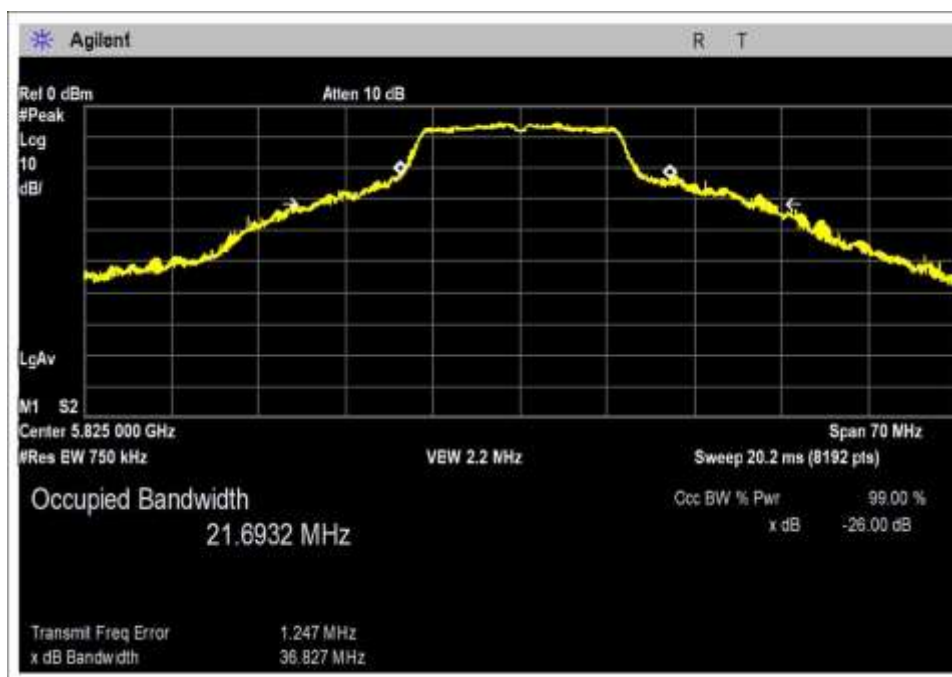
99% Occupied Bandwidth 802.11a



Low Channel

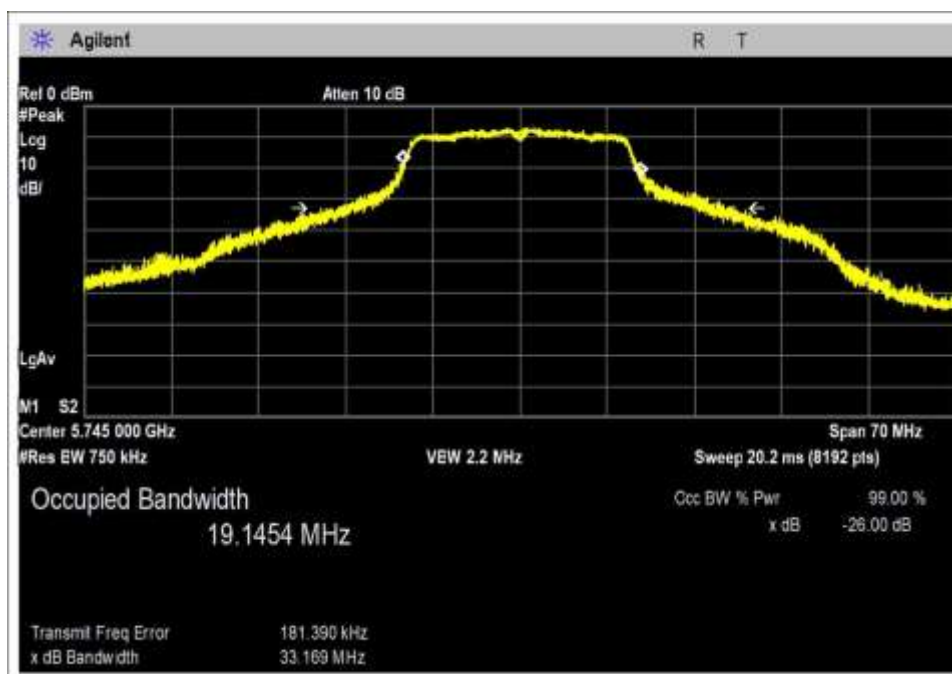


Middle Channel

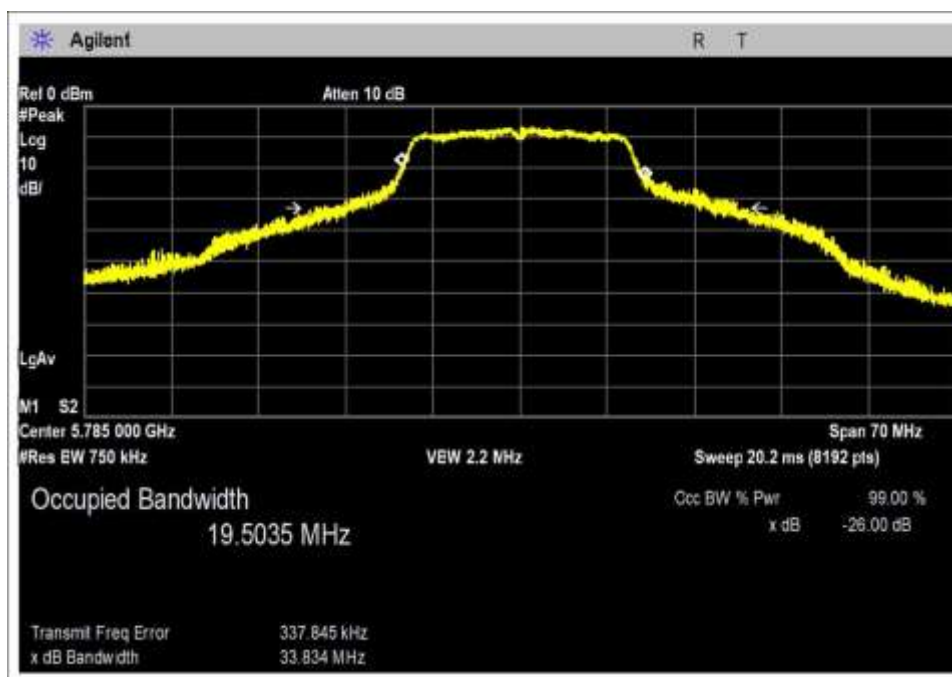


High Channel

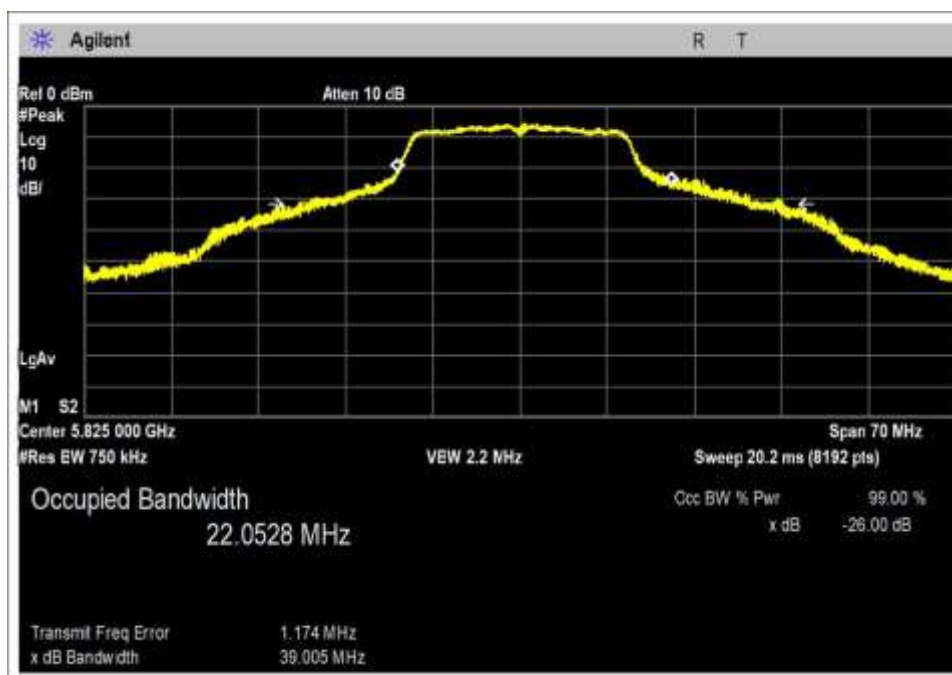
99% Occupied Bandwidth 802.11n20



Low Channel

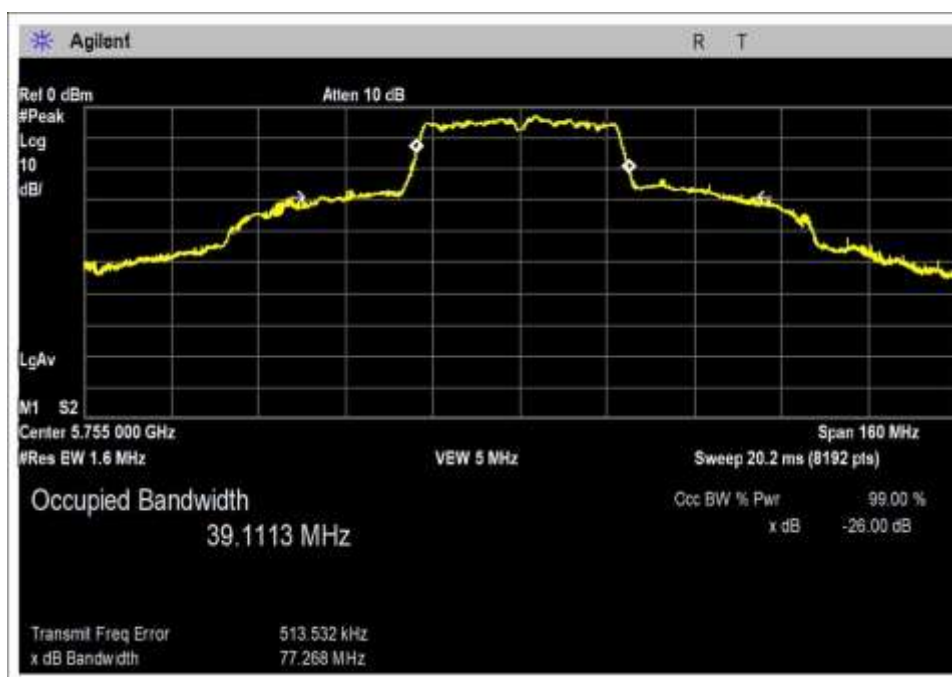


Middle Channel

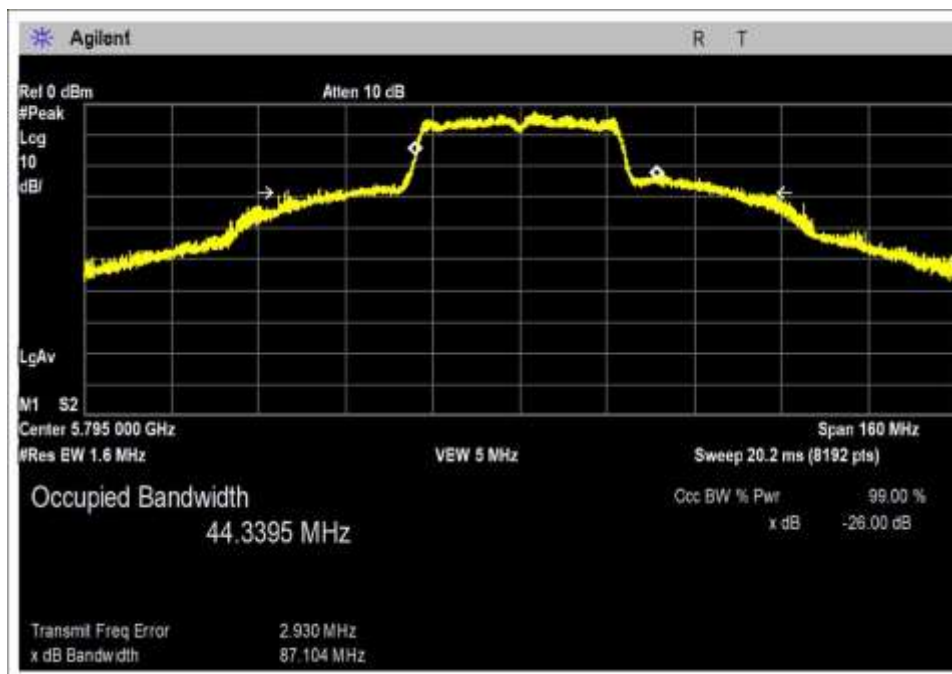


High Channel

99% Occupied Bandwidth 802.11n40

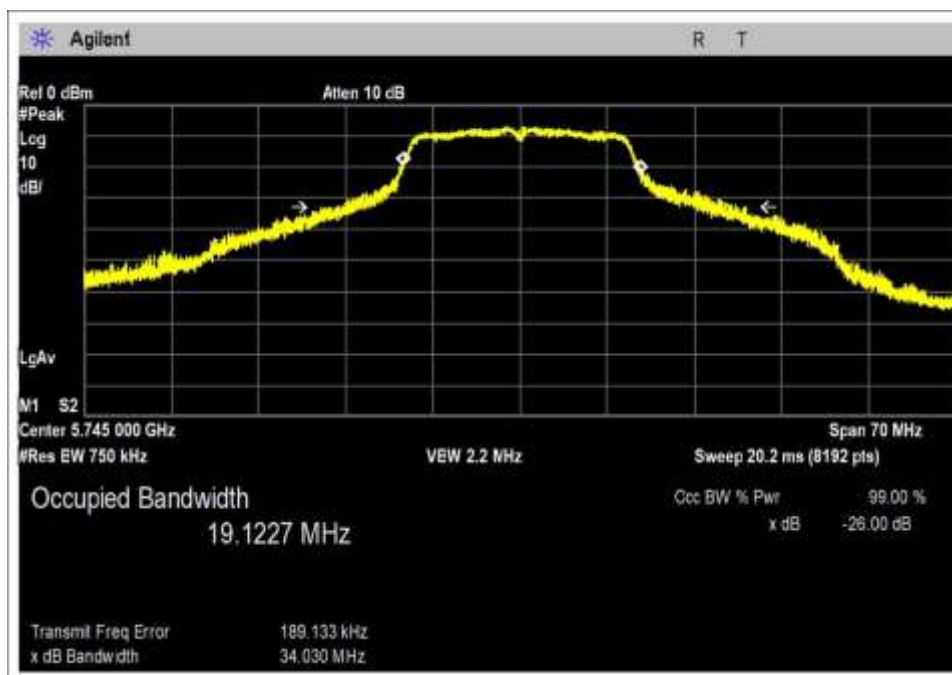


Low Channel

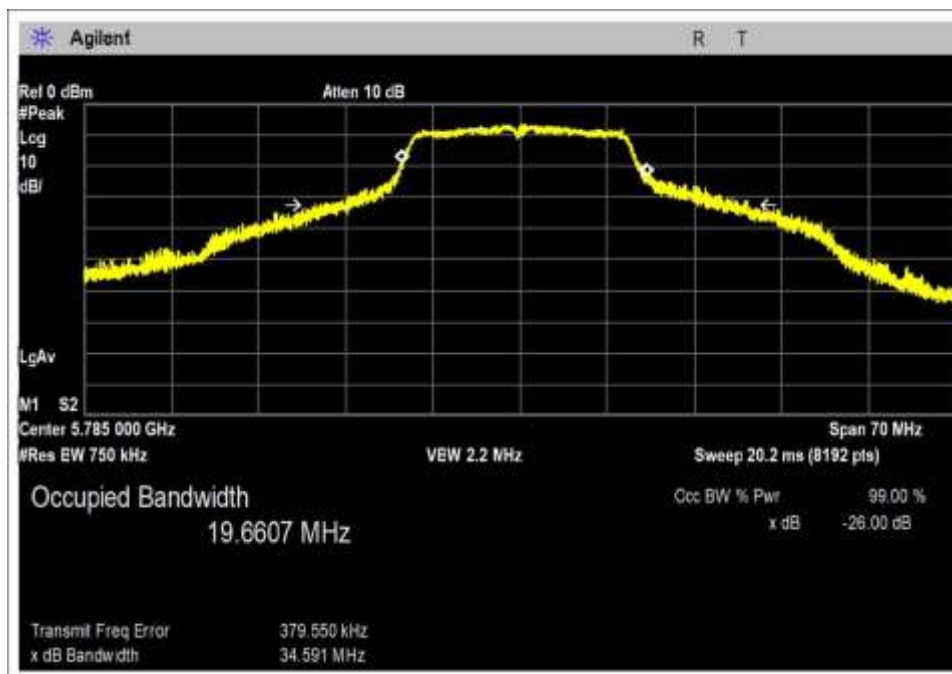


High Channel

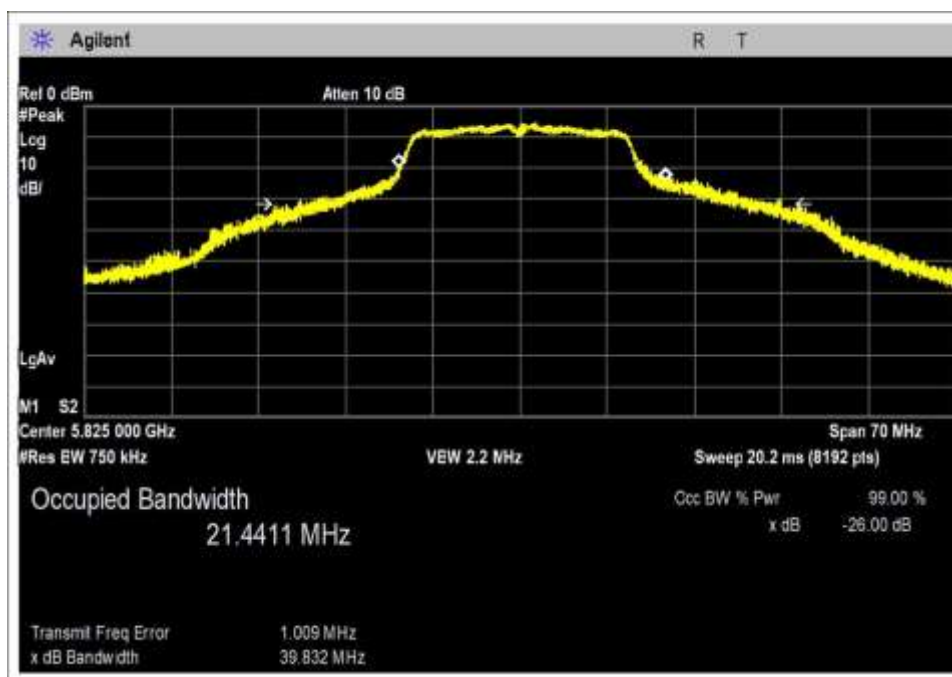
99% Occupied Bandwidth 802.11ac20



Low Channel

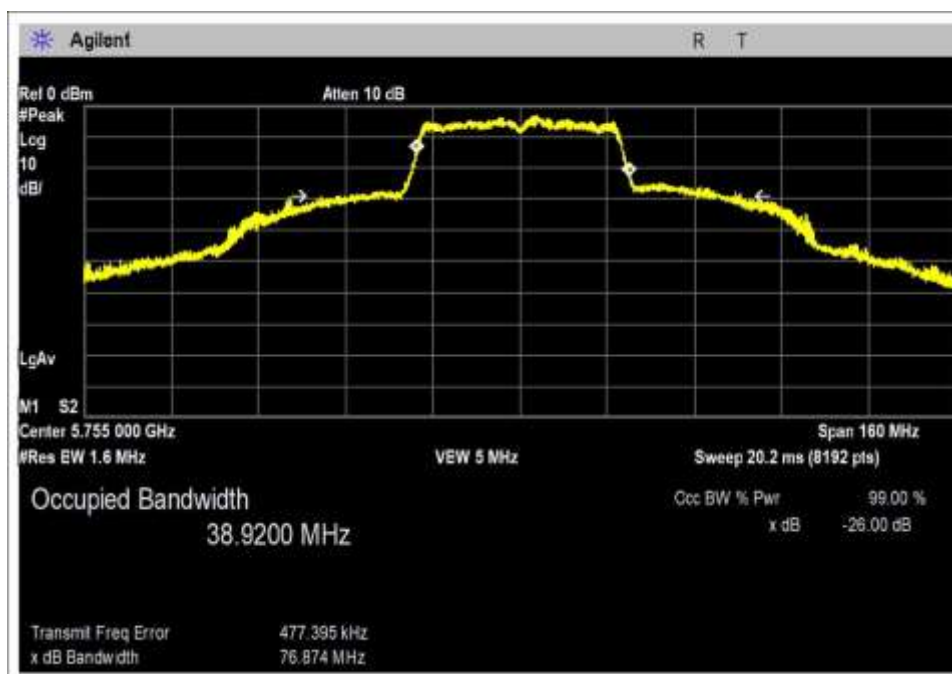


Middle Channel

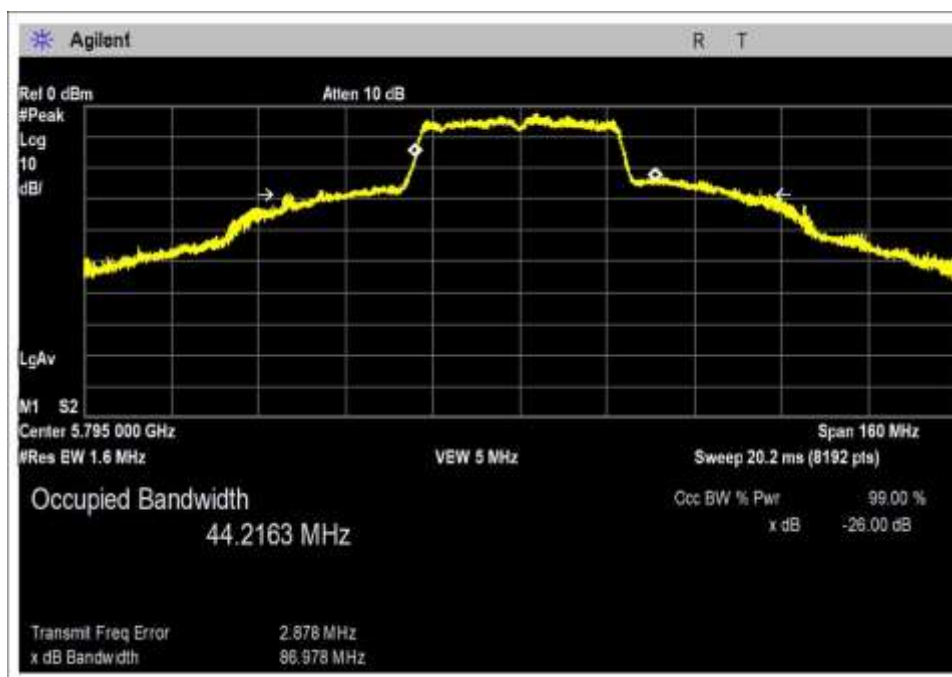


High Channel

99% Occupied Bandwidth 802.11ac40

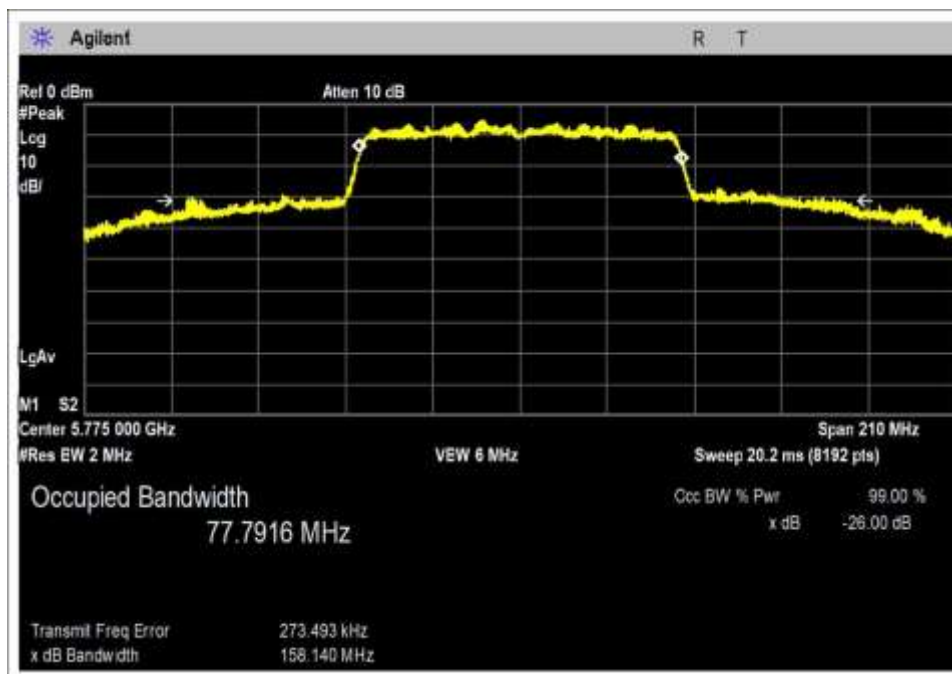


Low Channel



High Channel

99% Occupied Bandwidth 802.11ac80



15.207 AC Conducted Emissions

Test Data

Test Location: CKC Laboratories, Inc. • 22116 23rd Drive SE, Suite A • Bothell, WA 98021 • 1-800-500-4EMC (4362)
 Customer: **Nalloy, LLC**
 Specification: **15.207 AC Mains - Average**
 Work Order #: **106407** Date: 1/19/2022
 Test Type: **Conducted Emissions** Time: 09:15:02
 Tested By: M. Harrison Sequence#: 60
 Software: EMITest 5.03.20 120V 60Hz

Equipment Tested:

Device	Manufacturer	Model #	S/N
Configuration 1			

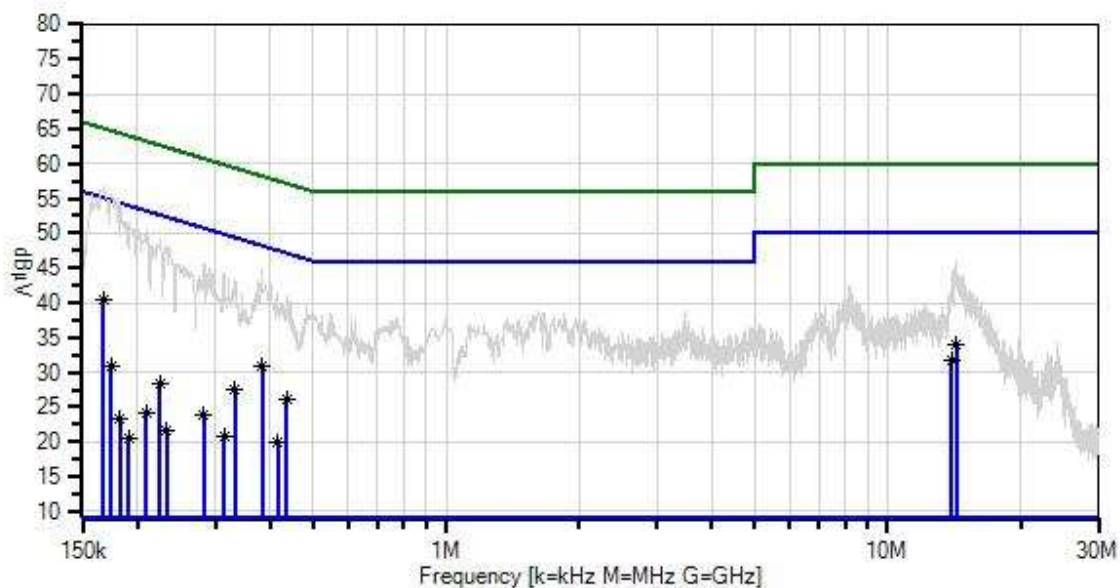
Support Equipment:

Device	Manufacturer	Model #	S/N
Configuration 1			

Test Conditions / Notes:

Environmental Conditions: Temperature: 21°C Humidity: 45% Pressure: 101.2kPa Method: ANSI C63.10: 2013 Frequency range: 150k-30 MHz Setup: Antenna 0 Channels: 5745, 5785, 5825 MHz 802.11a Band 4 Rate: 6-54Mbps PWR Output: 20 dBm 100% Duty Cycle Notes:
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Nalloy, LLC W/O#: 106121 Sequence#: 60 Date: 1/19/2022
15.207 AC Mains - Average Test Lead: 120V 60Hz Line



Test Equipment:

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
T1	ANP06219	Attenuator	768-10	4/7/2020	4/7/2022
T2	ANP06011	Cable	Heliac	8/7/2020	8/7/2022
T3	ANP06515	Cable	Heliac	7/1/2020	7/1/2022
T4	AN01311	50uH LISN-Line1 (L)	3816/2	2/24/2020	2/24/2022
	AN01311	50uH LISN-Line2 (N)	3816/2	2/24/2020	2/24/2022
T5	AN02611	High Pass Filter	HE9615-150K-50-720B	1/5/2022	1/5/2024
	AN02673	Spectrum Analyzer	E4446A	2/3/2021	2/3/2023

Measurement Data:

Reading listed by margin.

Test Lead: Line

#	Freq MHz	Rdng dBμV	T1 T5 dB	T2 dB	T3 dB	T4 dB	Dist Table	Corr dBμV	Spec dBμV	Margin dB	Polar Ant
1	167.452k	29.3	+9.1 +0.3	+0.0	+0.0	+1.6	+0.0	40.3	55.1	-14.8	Line
^	167.451k	45.7	+9.1 +0.3	+0.0	+0.0	+1.6	+0.0	56.7	55.1	+1.6	Line
3	14.337M	24.0	+9.1 +0.0	+0.0	+0.2	+0.6	+0.0	33.9	50.0	-16.1	Line
^	14.337M	36.2	+9.1 +0.0	+0.0	+0.2	+0.6	+0.0	46.1	50.0	-3.9	Line
5	382.705k	21.1	+9.1 +0.1	+0.0	+0.0	+0.5	+0.0	30.8	48.2	-17.4	Line
^	382.704k	35.3	+9.1 +0.1	+0.0	+0.0	+0.5	+0.0	45.0	48.2	-3.2	Line
7	13.968M	21.9	+9.1 +0.0	+0.0	+0.2	+0.6	+0.0	31.8	50.0	-18.2	Line
^	13.968M	34.6	+9.1 +0.0	+0.0	+0.2	+0.6	+0.0	44.5	50.0	-5.5	Line
9	435.791k	16.3	+9.1 +0.1	+0.0	+0.0	+0.5	+0.0	26.0	47.1	-21.1	Line
^	435.790k	31.3	+9.1 +0.1	+0.0	+0.0	+0.5	+0.0	41.0	47.1	-6.1	Line
11	333.255k	17.9	+9.1 +0.0	+0.0	+0.0	+0.6	+0.0	27.6	49.4	-21.8	Line
^	333.254k	33.7	+9.1 +0.0	+0.0	+0.0	+0.6	+0.0	43.4	49.4	-6.0	Line
13	173.997k	20.0	+9.1 +0.3	+0.0	+0.0	+1.5	+0.0	30.9	54.8	-23.9	Line
^	173.996k	44.7	+9.1 +0.3	+0.0	+0.0	+1.5	+0.0	55.6	54.8	+0.8	Line
15	224.901k	18.1	+9.1 +0.1	+0.0	+0.0	+1.0	+0.0	28.3	52.6	-24.3	Line
^	224.901k	38.9	+9.1 +0.1	+0.0	+0.0	+1.0	+0.0	49.1	52.6	-3.5	Line
17	283.078k	14.1	+9.1 +0.0	+0.0	+0.0	+0.8	+0.0	24.0	50.7	-26.7	Line
^	283.077k	36.0	+9.1 +0.0	+0.0	+0.0	+0.8	+0.0	45.9	50.7	-4.8	Line
19	415.429k	10.2	+9.1 +0.1	+0.0	+0.0	+0.5	+0.0	19.9	47.5	-27.6	Line
^	415.429k	31.9	+9.1 +0.1	+0.0	+0.0	+0.5	+0.0	41.6	47.5	-5.9	Line
21	313.620k	11.1	+9.1 +0.0	+0.0	+0.0	+0.7	+0.0	20.9	49.9	-29.0	Line
^	313.620k	34.4	+9.1 +0.0	+0.0	+0.0	+0.7	+0.0	44.2	49.9	-5.7	Line
23	209.630k	13.8	+9.1 +0.1	+0.0	+0.0	+1.1	+0.0	24.1	53.2	-29.1	Line

^	209.629k	40.2	+9.1 +0.1	+0.0	+0.0	+1.1	+0.0	50.5	53.2	-2.7	Line
25	232.900k Ave	11.5	+9.1 +0.1	+0.0	+0.0	+1.0	+0.0	21.7	52.3	-30.6	Line
^	232.900k	37.9	+9.1 +0.1	+0.0	+0.0	+1.0	+0.0	48.1	52.3	-4.2	Line
27	181.996k Ave	12.4	+9.1 +0.3	+0.0	+0.0	+1.4	+0.0	23.2	54.4	-31.2	Line
^	181.996k	43.8	+9.1 +0.3	+0.0	+0.0	+1.4	+0.0	54.6	54.4	+0.2	Line
29	191.450k Ave	10.1	+9.1 +0.1	+0.0	+0.0	+1.3	+0.0	20.6	54.0	-33.4	Line
^	191.449k	40.8	+9.1 +0.1	+0.0	+0.0	+1.3	+0.0	51.3	54.0	-2.7	Line



Test Location: CKC Laboratories, Inc. • 22116 23rd Drive SE, Suite A • Bothell, WA 98021 • 1-800-500-4EMC (4362)
 Customer: **Nalloy, LLC**
 Specification: **15.207 AC Mains - Average**
 Work Order #: **106407** Date: 1/19/2022
 Test Type: **Conducted Emissions** Time: 09:03:25
 Tested By: M. Harrison Sequence#: 59
 Software: EMITest 5.03.20 120V 60Hz

Equipment Tested:

Device	Manufacturer	Model #	S/N
Configuration 1			

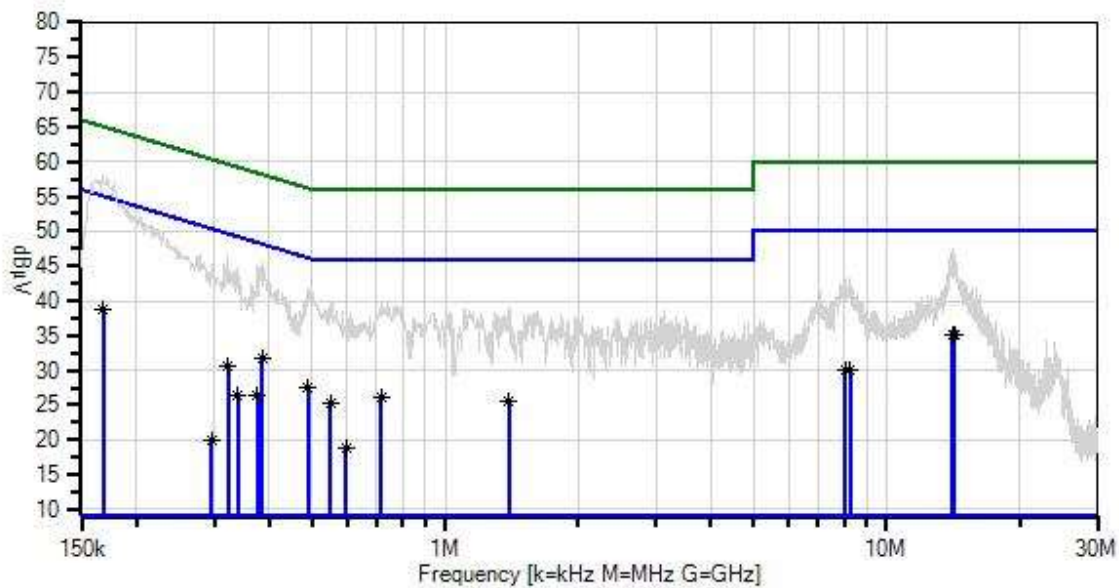
Support Equipment:

Device	Manufacturer	Model #	S/N
Configuration 1			

Test Conditions / Notes:

Environmental Conditions: Temperature: 21°C Humidity: 45% Pressure: 101.2kPa Method: ANSI C63.10: 2013 Frequency range: 150k-30 MHz Setup: Antenna 0 Channels: 5745, 5785, 5825 MHz 802.11a Band 4 Rate: 6-54Mbps PWR Output: 20 dBm 100% Duty Cycle Notes:
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Nalloy, LLC WO#: 106121 Sequence#: 59 Date: 1/19/2022
15.207 AC Mains - Average Test Lead: 120V 60Hz Neutral



— Sweep Data
× QP Readings
Software Version: 5.03.20
— Readings
* Average Readings
— 1 - 15.207 AC Mains - Average
○ Peak Readings
▼ Ambient
— 2 - 15.207 AC Mains - Quasi-peak

Test Equipment:

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
T1	ANP06219	Attenuator	768-10	4/7/2020	4/7/2022
T2	ANP06011	Cable	Heliac	8/7/2020	8/7/2022
T3	ANP06515	Cable	Heliac	7/1/2020	7/1/2022
T4	AN01311	50uH LISN-Line1 (L)	3816/2	2/24/2020	2/24/2022
	AN01311	50uH LISN-Line2 (N)	3816/2	2/24/2020	2/24/2022
T5	AN02611	High Pass Filter	HE9615-150K-50-720B	1/5/2022	1/5/2024
	AN02673	Spectrum Analyzer	E4446A	2/3/2021	2/3/2023

Measurement Data:

Reading listed by margin.

Test Lead: Neutral

#	Freq MHz	Rdng dBμV	T1 T5 dB	T2 dB	T3 dB	T4 dB	Dist Table	Corr dBμV	Spec dBμV	Margin dB	Polar Ant
1	14.130M	25.3	+9.1 +0.0	+0.0	+0.2	+0.6	+0.0	35.2	50.0	-14.8	Neutr
^	14.130M	37.5	+9.1 +0.0	+0.0	+0.2	+0.6	+0.0	47.4	50.0	-2.6	Neutr
3	14.256M	25.3	+9.1 +0.0	+0.0	+0.2	+0.6	+0.0	35.2	50.0	-14.8	Neutr
^	14.256M	36.7	+9.1 +0.0	+0.0	+0.2	+0.6	+0.0	46.6	50.0	-3.4	Neutr
5	168.180k	27.8	+9.1 +0.3	+0.0	+0.0	+1.5	+0.0	38.7	55.0	-16.3	Neutr
^	168.180k	47.3	+9.1 +0.3	+0.0	+0.0	+1.5	+0.0	58.2	55.0	+3.2	Neutr
7	384.888k	21.9	+9.1 +0.1	+0.0	+0.0	+0.5	+0.0	31.6	48.2	-16.6	Neutr
^	384.887k	35.9	+9.1 +0.1	+0.0	+0.0	+0.5	+0.0	45.6	48.2	-2.6	Neutr
9	490.332k	18.0	+9.1 +0.1	+0.0	+0.0	+0.4	+0.0	27.6	46.2	-18.6	Neutr
^	490.332k	32.2	+9.1 +0.1	+0.0	+0.0	+0.4	+0.0	41.8	46.2	-4.4	Neutr
11	321.621k	21.0	+9.1 +0.0	+0.0	+0.0	+0.6	+0.0	30.7	49.7	-19.0	Neutr
^	321.620k	37.0	+9.1 +0.0	+0.0	+0.0	+0.6	+0.0	46.7	49.7	-3.0	Neutr
13	8.058M	20.5	+9.1 +0.0	+0.0	+0.1	+0.4	+0.0	30.1	50.0	-19.9	Neutr
^	8.058M	33.5	+9.1 +0.0	+0.0	+0.1	+0.4	+0.0	43.1	50.0	-6.9	Neutr
15	8.265M	20.3	+9.1 +0.0	+0.0	+0.1	+0.5	+0.0	30.0	50.0	-20.0	Neutr
^	8.265M	33.6	+9.1 +0.0	+0.0	+0.1	+0.5	+0.0	43.3	50.0	-6.7	Neutr
17	716.493k	16.4	+9.1 +0.2	+0.0	+0.0	+0.3	+0.0	26.0	46.0	-20.0	Neutr
^	716.493k	30.4	+9.1 +0.2	+0.0	+0.0	+0.3	+0.0	40.0	46.0	-6.0	Neutr
19	1.396M	15.9	+9.1 +0.1	+0.0	+0.0	+0.3	+0.0	25.4	46.0	-20.6	Neutr
^	1.396M	29.6	+9.1 +0.1	+0.0	+0.0	+0.3	+0.0	39.1	46.0	-6.9	Neutr
21	549.963k	15.6	+9.1 +0.1	+0.0	+0.0	+0.4	+0.0	25.2	46.0	-20.8	Neutr
^	549.963k	30.0	+9.1 +0.1	+0.0	+0.0	+0.4	+0.0	39.6	46.0	-6.4	Neutr
23	375.434k	16.6	+9.1 +0.1	+0.0	+0.0	+0.6	+0.0	26.4	48.4	-22.0	Neutr

^	375.433k	35.1	+9.1 +0.1	+0.0	+0.0	+0.6	+0.0	44.9	48.4	-3.5	Neutr
25	339.074k Ave	16.6	+9.1 +0.0	+0.0	+0.0	+0.6	+0.0	26.3	49.2	-22.9	Neutr
^	339.073k	34.9	+9.1 +0.0	+0.0	+0.0	+0.6	+0.0	44.6	49.2	-4.6	Neutr
27	595.777k Ave	9.4	+9.1 +0.1	+0.0	+0.0	+0.4	+0.0	19.0	46.0	-27.0	Neutr
^	595.777k	29.9	+9.1 +0.1	+0.0	+0.0	+0.4	+0.0	39.5	46.0	-6.5	Neutr
29	296.168k Ave	10.2	+9.1 +0.0	+0.0	+0.0	+0.7	+0.0	20.0	50.3	-30.3	Neutr
^	296.168k	35.4	+9.1 +0.0	+0.0	+0.0	+0.7	+0.0	45.2	50.3	-5.1	Neutr

SUPPLEMENTAL INFORMATION

Measurement Uncertainty

Uncertainty Value	Parameter
4.73 dB	Radiated Emissions
3.34 dB	Mains Conducted Emissions
3.30 dB	Disturbance Power

Uncertainties reported are worst case for all CKC Laboratories' sites and represent expanded uncertainties expressed at approximately the 95% confidence level using a coverage factor of $k=2$. Compliance is deemed to occur provided measurements are below the specified limits.

Emissions Test Details

TESTING PARAMETERS

Unless otherwise indicated, the following configuration parameters are used for equipment setup: The cables were routed consistent with the typical application by varying the configuration of the test sample. Interface cables were connected to the available ports of the test unit. The effect of varying the position of the cables was investigated to find the configuration that produced maximum emissions. Cables were of the type and length specified in the individual requirements. The length of cable that produced maximum emissions was selected.

The equipment under test (EUT) was set up in a manner that represented its normal use, as shown in the setup photographs. Any special conditions required for the EUT to operate normally are identified in the comments that accompany the emissions tables.

The emissions data was taken with a spectrum analyzer or receiver. Incorporating the applicable correction factors for distance, antenna, cable loss and amplifier gain, the data was reduced as shown in the table below. The corrected data was then compared to the applicable emission limits. Preliminary and final measurements were taken in order to ensure that all emissions from the EUT were found and maximized.

CORRECTION FACTORS

The basic spectrum analyzer reading was converted using correction factors as shown in the highest emissions readings in the tables. For radiated emissions in $\text{dB}\mu\text{V}/\text{m}$, the spectrum analyzer reading in $\text{dB}\mu\text{V}$ was corrected by using the following formula. This reading was then compared to the applicable specification limit. Individual measurements were compared with the displayed limit value in the margin column. The margin was calculated based on subtracting the limit value from the corrected measurement value; a positive margin represents a measurement exceeding the limit, while a negative margin represents a measurement less than the limit.

SAMPLE CALCULATIONS		
	Meter reading	($\text{dB}\mu\text{V}$)
+	Antenna Factor	(dB/m)
+	Cable Loss	(dB)
-	Distance Correction	(dB)
-	Preamplifier Gain	(dB)
=	Corrected Reading	($\text{dB}\mu\text{V}/\text{m}$)

TEST INSTRUMENTATION AND ANALYZER SETTINGS

The test instrumentation and equipment listed were used to collect the emissions data. A spectrum analyzer or receiver was used for all measurements. Unless otherwise specified, the following table shows the measuring equipment bandwidth settings that were used in designated frequency bands. For testing emissions, an appropriate reference level and a vertical scale size of 10 dB per division were used.

MEASURING EQUIPMENT BANDWIDTH SETTINGS PER FREQUENCY RANGE			
TEST	BEGINNING FREQUENCY	ENDING FREQUENCY	BANDWIDTH SETTING
CONDUCTED EMISSIONS	150 kHz	30 MHz	9 kHz
RADIATED EMISSIONS	9 kHz	150 kHz	200 Hz
RADIATED EMISSIONS	150 kHz	30 MHz	9 kHz
RADIATED EMISSIONS	30 MHz	1000 MHz	120 kHz
RADIATED EMISSIONS	1000 MHz	>1 GHz	1 MHz

SPECTRUM ANALYZER/RECEIVER DETECTOR FUNCTIONS

The notes that accompany the measurements contained in the emissions tables indicate the type of detector function used to obtain the given readings. Unless otherwise noted, all readings were made in the "positive peak" detector mode. Whenever a "quasi-peak" or "average" reading was recorded, the measurement was annotated with a "QP" or an "Ave" on the appropriate rows of the data sheets. In cases where quasi-peak or average limits were employed and data exists for multiple measurement types for the same frequency then the peak measurement was retained in the report for reference, however the numbering for the affected row was removed and an arrow or caret ("^") was placed in the far left-hand column indicating that the row above takes precedence for comparison to the limit. The following paragraphs describe in more detail the detector functions and when they were used to obtain the emissions data.

Peak

In this mode, the spectrum analyzer or receiver recorded all emissions at their peak value as the frequency band selected was scanned. By combining this function with another feature called "peak hold," the measurement device had the ability to measure intermittent or low duty cycle transient emission peak levels. In this mode the measuring device made a slow scan across the frequency band selected and measured the peak emission value found at each frequency across the band.

Quasi-Peak

Quasi-peak measurements were taken using the quasi-peak detector when the true peak values exceeded or were within 2 dB of a quasi-peak specification limit. Additional QP measurements may have been taken at the discretion of the operator.

Average

Average measurements were taken using the average detector when the true peak values exceeded or were within 2 dB of an average specification limit. Additional average measurements may have been taken at the discretion of the operator. If the specification or test procedure requires trace averaging, then the averaging was performed using 100 samples or as required by the specification. All other average measurements are performed using video bandwidth averaging. To make these measurements, the test engineer reduces the video bandwidth on the measuring device until the modulation of the signal is filtered out. At this point the measuring device is set into the linear mode and the scan time is reduced.